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NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

THESIS

**THE NEXT BEST ALTERNATIVE TO AN IDEAL RECRUIT:
ATTRITION CHARACTERISTICS OF RECRUITS WITH
WAIVERS AND LOW EDUCATIONAL CREDENTIALS IN
THE U.S. ARMY**

by

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March 2009

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**THE NEXT BEST ALTERNATIVE TO AN IDEAL RECRUIT: ATTRITION
CHARACTERISTICS OF RECRUITS WITH WAIVERS AND LOW
EDUCATIONAL CREDENTIALS IN THE ARMY**

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requirements for the degree of

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ABSTRACT

The supply of high quality recruits is limited and services are facing a diminishing recruiting market. Under these constraints, it is important to identify which groups of recruits are the next best alternatives to an ideal recruit. This research examines the attrition rates of recruits with less-than ideal qualifications, which include recruits enlisted with waivers, without high school diploma or with low AFQT scores in the U.S. Army. The secondary focus of this study is to analyze the effect of a conduct or drug waiver on attrition due to behavioral or drug problems. We use data from the Defense Manpower Data Center (DMDC) consisting of all enlisted accessions for U.S. Army between fiscal year 2000 and fiscal year 2006. We employ multivariate data analysis to analyze both attrition and unsuitability attrition.

The study reveals that educational credentials have a decreasing effect on both attrition and unsuitability attrition. Conduct waivers have a decreasing effect on early attrition, but an increasing effect on first term attrition. Unsuitability attrition rates of recruits with conduct waivers are higher for all subcategories with drug waivers leading. Recruits with medical waivers are more likely to attrite in all attrition points, but this effect is likely to be offset by higher educational standards. They are also less likely to attrite for unsuitability reasons.

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I. INTRODUCTION

A. BACKGROUND

Since the beginning of the “all volunteer force,” a primary concern of the services has been identifying, attracting, and retaining the most capable and highest quality recruits. The services use information on several observable characteristics of prospective enlistees to determine which ones will be more likely to succeed in the military. These include age, educational credentials, and character standards. If the applicant is eligible to apply after these initial qualifications, scores in the ASVAB test which also includes the AFQT¹ score and physical exams are used to further screen applicants. The AFQT test is a measure of trainability, predictor of on-the-job performance, and the primary index of recruit aptitude for the services (Office of the Under Secretary of Defense, Personnel and Readiness, n.d.).

The Department of Defense (DoD) defines 'high quality recruits' as those who have regular high school diplomas or above and have scored in the upper half (over 50) of the AFQT (Defense Link, n.d.). The supply of high quality recruits is limited, however, especially since, in recent years, the college enrollment rates among youth have increased (Asch et.al. RAND 2002). Attracting and retaining more high quality recruits is costly. As a result, the services must accept enlistees with less than ideal qualifications, such as having a low AFQT score, not having a high school diploma, having criminal records, or behavioral problems. These enlistees likely have lower productivity in the military. In addition, studies have shown that low quality recruits have substantially higher attrition rates (Buddin, RAND 1988). Enlistees who do not have high school diplomas are much less likely than graduates to complete their first term of enlistment (Flyer, Elster, NPS, 1981), (Buddin, RAND, 1984).

¹ ASVAB, [The Armed Services Vocational Aptitude Battery] test is used by DoD to determine enlistment eligibility and qualifications for military occupations. It consists of 10 tests (or 11 tests if taking the computer-adaptive test at MEPS, 4 of which comprise the Armed Forces Qualification Test (AFQT)).

Besides educational background, other characteristics have been shown to have a strong effect on attrition. Most important for this study is the discovery that pre-service behavioral characteristics are related to attrition (Putka et al. HUMRRO 2004). Given the high costs (in terms of lower productivity and higher attrition) of having less-than-ideal recruits, it would be worthwhile to determine what types of less-than ideal recruits have the better and worse performance in their service. In this study we compare attrition rates for recruits based on conduct waivers and compare how those with conduct waivers do relative to the other less-than ideal characteristics of having a high school diploma and having a low AFQT score.

The military routinely grants waivers for recruits who would otherwise disqualify from the service because of medical problems, criminal backgrounds, drug usage, or low ASVAB test scores. Medical waivers are required if the applicant has a pre-existing medical condition or does not meet weight, or height standards. Conduct waivers are required if the applicant has committed a crime. Sub-categories of conduct waivers are minor traffic, serious traffic, minor non-traffic, serious non-traffic, felony, and drug waivers. Drug waivers are required if the applicant admits to having a drug or alcohol usage problem or if tests confirmed positive for drugs or alcohol. Other than these waivers, mental qualification, minimum education, dependency, previous military separation, citizenship waivers are granted for individuals who do not meet related standards. The entire list of waivers and how they were coded in this study is presented in Appendix C.

It is important to note that anyone who falls into one of the waiver categories does not qualify for enlistment until the waiver is granted. In consideration of granting waivers, military reaches judgment by virtue of the “whole person” in which all aspects of an applicant’s qualifications are examined (Office of the Under Secretary of Defense, Personnel and Readiness, 2008). According to Bill Carr, the undersecretary of military personnel policy, a recruit’s full record, the nature and the circumstances of the crime and when it was committed, the degree of rehabilitation and references from teachers, employers, coaches, and clergy members are scrutinized before granting conduct waivers (Alvarez, 2007). The process begins with the recruiter asking the applicant about records

of arrests, charges, juvenile court adjudications, traffic violations, probation periods, and dismissed or pending charges or convictions. This includes those which have been expunged or sealed. If the applicant admits to an offense, the recruiter believes the applicant is concealing an offense, or a record is indicated during the Entrance National Agency Check (ENAC), then the recruiter requests a complete criminal record from local law enforcement agencies. Recruiters do not have the authority to grant a waiver. In the Army, some waivers can be granted by Recruiting Battalion Commander; others are granted by the Commanding General of the Army Recruiting Command; and others can be only granted by the highest authority level (or equivalent positions for the other services) (Powers, n.d.).

B. RECRUITING MARKET

According to DoD recruiting statistics for fiscal year 2008, all services met their recruiting goals (Department of Defense, 2008). In fact, since 2000, the Army missed its target only in 2005 when it recruited about 73,000 (about 92% of the Army's goal of 80,000) (Defense Link, 2007). This figure prompted the Army to make some renovations in its recruiting system. The number of the recruiters has increased; changes have been made to the enlistment incentive program (involving more enlistment bonuses); and recruiting campaigns have also changed to better target parents and other influencers of today's youth (Gilmore, 2005). These changes have had an immediate impact: in 2006, the Army exceeded its 80,000 target by 635 recruits (Garamone, 2005). The number of waivers, however, — especially conduct waivers — have also increased in big proportions. In 2005, the total number of conduct waivers was 5,506, but in 2006 it increased 48 % to 8,129. Most troubling is that the number of waivers for felonies was 571 in 2005, but in 2006 increased by 58 % to 901 (Maze, 2007). Similar changes have also been observed in the educational credentials of recruits. In 2007, only 79 % of recruits had high school diplomas. This was significantly lower than the DoD standard of 90%. Things improved in FY2008. The felony waivers have decreased to 511 in 2007 and 372 in 2008. Also in 2008, high school diploma graduates increased to 83% (Baker III, 2008).

Increases and fluctuations in the number of recruits with conduct waivers and lower educational credentials have attracted public attention. The Army has been widely criticized by the public media for diminishing the quality of the force by lowering its educational standards (Inskeep & Bowman, 2008) and accepting more recruits with behavioral problems to meet the recruiting goals. Some prisoner abuse events in Abu Ghraib prison and other offenses committed by recruits with conduct waivers are compiled in a 13 July 2008 Sacramento Bee article (Carollo, 2008). According to Michelle Tan from *Army Times*, the policy of enlisting more less-than ideal recruits "...is sort of putting bad gas into the tank. It is cheaper but after a while you may need to change your engine." Representative Martin T. Meehan accepts that "the only way that armed forces can fill their recruiting quotas is by lowering their standards," but he also emphasized that this process "...endangers the rest of armed forces and sending the wrong message to potential recruits..."

Defense officials, however, claim that "[t]he waiver process recognizes that some young people have made mistakes, have overcome their past behavior and have clearly demonstrated the potential for being productive, law-abiding citizens and members of the military" (Maze, 2007). According to a late 2007 Army G-1 staff study, soldiers receiving conduct waivers are more likely to have a high school degree. They also tend to stay in the service longer, enlist at a higher rate, earn more valor medals, and get promoted faster (Tan, 2008). On the negative side, they have higher desertion, bad conduct, dishonorable discharge, and alcohol rehabilitation failure discharge rates. They also have more discipline problems and court-martials than recruits without conduct waivers. Lt. Col. Val Siegfried, the chief of enlisted accessions branch in the Army G-1, summarizes the results as "[T]here is a little bit more risk..., but we are also seeing a lot of goodness here."

Recent surveys by DoD, tracking the opinions of potential recruits between ages 16 to 21 show that "the inclination toward military service has fallen dramatically..." After the tragic events of 9/11, there was a short increase in enlistment propensity, but after 2004 this inclination has fallen rapidly (Tilghman, 2008) because of the extended war in Iraq. The percentage of the young men that answered "definitely" or "probably" to

the “likeliness of serving in the military in the next few years” has dropped to 13% from 25% in the late 80s. The picture is much worse for the Army: the percentage of young men 16 to 21 who said they will “definitely” or “probably” join the Army has declined to 8%. This compares to the 17 % figure at the time of the Gulf War in 1991.

The quality of the recruiting market is also changing. According to Army Lt. Gen. Michael D. Rochelle, deputy chief of staff for personnel, “3 out of 10 prospective enlistees between 18 and 24 do not qualify for enlistment due to health reasons, educational shortfalls, or character” (Gilmore, 2008). Recent numbers of high quality Army recruits are consistent with this statement as they dropped from 61% in 2004 to 49% in 2006 to 44% in 2007 (Defense Link, n.d.). Even when the services are still able to meet their recruiting goals by assigning more recruiters, utilizing sophisticated marketing campaigns, and increasing enlistment bonuses, these surveys show that the future of the recruiting market seems uncertain at best.

C. OBJECTIVES AND SCOPE

Attrition can be defined as failing to complete the initial contract period of a recruit. It has been widely used in the services to measure quality of recruits. Services make considerable investments in enlistees in the first months by training, recruiting, and related expenses. If attrition occurs, services are not able to get the desired return on their investment; thus, they must spend more money to increase accessions to replace these losses (GAO 1997). Some attrition is caused by wrongdoing, problems, or not meeting individual performance standards. In these cases, the services terminate these contracts. This type of attrition can be defined as Unsuitability attrition. It can have more negative effects, such as diminishing the public image of military and reducing unit morale, motivation, and cohesiveness. Even in terms of dollars, the cost of each attrition is the same, in terms of intangible assets, unsuitability attrition can have more costs. Thus, when analyzing the next best alternative to an ideal recruit, this thesis will study their effects on both attrition and unsuitability attrition.

Since recruiting targets are harder to meet in a tight recruiting market and retaining and attracting more high quality recruits is costly, it has become increasingly important to identify which demographic groups are the next best alternative to an ideal recruit. This thesis focuses on this question by setting up two different attrition models at the 180-day, 365-day, and end of the first term time points. In the first attrition model, the effect of demographic variables, educational credentials, and waivers on attrition is analyzed. In the second model the sample will be divided into 8 subgroups which are defined by status of conduct waiver, high school diploma or more, and an AFQT score of 50 or more. Since recruits with high school diplomas, an AFQT score of 50 or more, and no conduct waivers form the high quality or ideal recruits, the other groups will be less-than ideal recruits. This will show attrition rates of less-than ideal recruits compared to ideal ones.

According to a 1997 GAO report, about 14% of recruits enlisted in 1994 have attrited within six months. 83% of these attriters have assigned codes indicating they are medically unqualified, had character or behavior disorders, had fraudulently or erroneously entered the military, or failed to meet minimum performance criteria (Government Accountability Office, 1997). Except medically unqualified code, these codes form the biggest part of unsuitability attrition. Military does not want to keep the services of these problem individuals. Thus, it is important to analyze attrition reasons. It is also important to identify if attrition is related to individual characteristics. Further, whether recruits with conduct and drug waivers are likely to repeat their behaviors in the military must be analyzed. For these reasons, this study also aims to capture the unsuitability attrition reasons and relationship between having a conduct and drug waiver and attrition from conduct and drug reasons. Two different models are developed and unsuitability attrition categories are defined (APPENDIX A). In the first model, the factors effecting unsuitability attrition are analyzed. In the second model, unsuitability attrition rates of 8 subgroups defined in the attrition model are investigated.

D. SUMMARY OF CHAPTERS

In Chapter II, we discuss previous studies about attrition of less-than-ideal qualification recruits. Since conduct waivers draw more of the public's attention and there are other issues, such as non-standardization of applications and changing policies, conduct waivers studies comprise the majority of this chapter. Chapter III describes the data and the variables utilized in the study. Summary statistics and methodology used in this study are also discussed in this chapter. Chapter IV presents the regression models and analysis of the results. Chapter V presents the findings and, based on the findings, conclusions and recommendations are provided.

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II. LITERATURE REVIEW

Recruiting high quality individuals is more difficult because they have better civilian job opportunities. In order to recruit more high quality recruits, services typically need to spend more money on enlistment bonuses, educational benefits, advertisements, or recruiters (Warner & Asch, 1995). Since the resources for recruiting and the supply of high quality recruits are limited, services have to fill some of their remaining ranks with less than high quality recruits.

Retaining the existing soldiers is also as important as recruiting. Services invest considerably on educating and training recruits. Numerous studies have analyzed the factors which affect attrition. Educational credentials, criminal, drug history or waiver status of recruits have been the focus of some of these studies. In particular, educational credentials accounted for recruits' mental capacities; criminal, drug history, or waiver status accounted for recruits' behavioral, conduct, or physical characteristics.

In reviewing prior literature, we first focus on the effect of personnel quality and general background characteristics on attrition. Then we review the literature on the attrition behavior of recruits with moral waivers. Some early studies which focused on the unsuitability attrition of recruits do not rely only on moral waivers, but reviewed criminal histories of enlistees. Later studies focused on the effect of moral waivers on both unsuitability attrition and general attrition in the first 6 months, 1 year, 18 months, and first term. Finally, this thesis explains a few of the problems with the conduct waiver system, data shortages, and lack of standardization of the waiver process — all problems shared by prior studies on moral waivers. Since these studies were made before the title change of moral waiver as conduct waiver, this chapter uses moral waiver and conduct waiver titles interchangeably to preserve originality.

A. HIGH QUALITY RECRUITS AND ATTRITION CHARACTERISTICS

The quality of enlisted personnel has been one of the biggest concerns of the services because high quality personnel have lower attrition and higher promotion and reenlistment rates.

A 2005 RAND study (Asch et.al.) compares attrition, reenlistment, and promotion behavior of high quality personnel with other personnel. The study uses longitudinal data provided by the DMDC on enlistees who entered the military between FY78 and FY92 and who are followed through FY96. To examine quality differences of recruits who complete their first terms with recruits who attrite, Asch et.al compared the average quality of recruits who attrite from the average quality of recruits who complete their terms. Three quality measures are used: two are based on entry characteristics (AFQT score and education); one exploits first-term promotion to infer quality as revealed on the job (quality index). The quality index, (AFQT score and other factors), is intended to reflect the overall quality of the job match between the recruit and the military as revealed over time. This index is formulated to be the sum of the member's observed and unobserved quality. The quality index is estimated using information on promotion speed for members in a given service, enlistment cohort, and occupation. The size of the correlation in promotion speeds to E-4 and E-5 provides information about the relative importance of the unobserved quality factor. Using only AFQT score as the measure of personnel quality, the authors find that across entering cohorts and occupational groups, the average quality of those who attrite is generally not much different from that for those who complete their first term. They also find little difference in the quality of those who stay, leave, or get promoted when they use only the high school diploma attainment as a measure of quality. This finding is due partially to the fact that, for later cohorts in the data (FY84 through FY92), almost all enlisted personnel are high school graduates. Finally, using a quality index as a measure of recruit quality, they find that those who complete their first term, those who stay until the eighth or twelfth year of service, and those who are promoted to higher grades are of significantly higher quality even among more recent cohorts.

Based on their findings, they conclude that individuals who have higher AFQT scores, those with high school diplomas, and those with a higher quality index are less likely to attrite during the first term. The quality index they construct cannot be observed

at entry, but is revealed on the job. The authors believe that to some extent quality index still can be obtained and used for the first term attrition studies. This is because some of the personnel remained in service long enough to allow the calculations.

In an attempt to identify which characteristics affect attrition, the study of Wenger & Hodari (CNA, July 2004) is also important. Wenger & Hodari get the information on specific education credentials, attitudes, and behaviors from the CNA survey given to new recruits in each of the four services between March 1999 and February 2000. They match the survey responses with DMDC personnel files. Logit models are used to determine how various characteristics affect attrition. The survey information allows them to include several personal characteristics — e.g., smoking and drinking behavior before entering the Delayed Entry Program (DEP), attitudes toward responsibility and patriotism, and participation in school activities — which were not included in most previous studies. It is difficult to collect this information on potential recruits, especially if they understand that their answers affect their probability of admission to the Armed Services. It is more likely that potential recruits will under-report alcohol use because most are under the legal drinking age; they will over-report the attitudes toward responsibility and patriotism in hopes of gaining entry. The authors believed that the information on the surveys is accurate because it was collected from the recruits who had already entered the military.

In their regressions, the authors include similar variables to previous studies on attrition in addition to indicators of non-cognitive factors, e.g., ever expelled from a school, ever considered dropping out of high school, smoker type, conduct waiver status, and public versus private school attendance. The authors estimate separate models for each service, for recruits who are high school diploma graduates (HSDGs), and for those who are without high school diplomas (NHSDGs). For NHSDGs, waiver status explains attrition only for recruits in the Navy (for other services it is insignificant). Among NHSDGs, conduct waivers have 6.1% higher attrition rates than recruits without conduct waivers. HSDGs with waivers have higher attrition rates in the Marines and the Navy (4.5% and 5.6%, respectively). For the Air Force and the Army, the coefficient on “conduct waiver” is insignificant. The study confirms prior findings on the effect of

education credentials. It also highlights that other previously non-measured factors are also important. For example, marital status increases attrition rates, but only for female recruits. Older recruits with alternate credentials have lower attrition rates than younger recruits with alternate credentials. In the case of traditional diploma graduates, however, there is little difference in attrition rates among those who are 18 or older. Attending at least 12 years of school is also associated with lower attrition for those who lack traditional high school diplomas. Recruits with certificates of completion or attendance have substantially lower attrition rates than other NHSDGs. Given current trends in education reform, both the number of GED holders and the number of certificate holders are likely to increase in the future (p. 44). Finally, state-level policies can affect attrition rates: homeschooled students from states with minimal regulation have higher attrition rates than homeschooled students from states with more stringent regulations (p. 6). Their regression results show that including such non-cognitive factors in regression equations separates the effect of credentials from that of the personal characteristics. The results suggest that overall attrition could be decreased by selecting NHSDGs with the most favorable personal characteristics.

B. STUDIES ABOUT MORAL (CONDUCT) WAIVERS

Most studies about conduct waivers focus on unsuitability attrition more than general attrition. In some cases, they are analyzed together. In this section, we discuss the studies about conduct waivers according to focus area and in chronological order. Since some studies focus on both unsuitability and general attrition, this thesis analyzes them according to those studies' primary focus areas. Early studies about unsuitability attrition focused on the available criminal histories of the recruits and their effect on unsuitability. Later studies focused on unsuitability attrition in terms of the conduct waivers and tried to analyze re-offending likelihood of these recruits. Some other studies focused on attrition characteristics of recruits with conduct waivers in different time points, such as Basic Combat Training (BCT) or first 6 months, one year, first term, or according to available data which can go beyond first term.

1. Criminal History — Unsuitability Attrition Relation

Unsuitability attrition can be described as attriting because of the wrongdoings, problems, or not meeting the performance standards of individuals. Boucai (2007) suggests that “when a service member separates for unsuitability reasons ..., the system failed to detect a fatal, inherent flaw in the applicant.” Some of the first studies on unsuitability attrition were done by Flyer (1995) and Frabutt (1996). They obtained criminal records in a few states to investigate the effect of behavioral problems on unsuitability attrition.

Flyer (1995) examined the relationship between arrest history and unsuitability discharge by obtaining adult and juvenile records in Florida, Illinois, and California as well as military enlistment files. Since military mostly relies on self disclosure of criminal histories of prospective recruits, Flyer assumed that this data better identified individuals with criminal histories. He found that 14% of the recruits had arrest histories according to military enlistment files. This figure, however, doubled to 30% when official records from states were taken into account (generalized from California data). According to Flyer, “the arrest itself is considered by many criminologists to be more important indicator of criminal activity...” (p. 27). Flyer found that recruits with a pre-service arrest history were 65% more likely to receive an unsuitability discharge than other recruits. This figure is twice larger than unsuitability attrition rates of recruits with a moral waiver. Parallel to his suggestion about using criminal arrest history, he found little difference between persons who were convicted and those who were arrested, but had the charges dropped. Finally he concluded that recruits with a pre-service arrest history had a higher risk of attriting and recommended that services should specifically focus on identifying arrest histories of recruits. Although it is a breakthrough to examine unsuitability attrition with state records for adult and juvenile arrest histories, the results are based on the percent differences in the descriptive statistics of recruits with arrest history and others. The conclusions of the study were based on the average attrition rate differences. They did not reveal whether these differences were explained in part by other observables, such as educational attainment and AFQT scores.

Frabutt (1996) examined the effect of arrest record on the unsuitability discharge during the first term of enlistment in the Navy. For California recruits who entered the Navy between 1982–1989, the data used was from California arrest records and DoD cohort data files. Since there were some deficiencies not related to DoD in the enlistment screening process, such as limited availability of criminal records, he believed that using the moral waivers data at hand may yield biased results. He also defended that, using actual arrest records of recruits, will allow studying the effect of actual backgrounds of recruit on unsuitability attrition and attrition as a whole. Several interactions were used to capture the effect of unsuitability attrition combined with other variables, such as AFQT scores, high school diploma, race, and job categories. He identified a pre-service legal encounter (PLE) variable which refers to individuals with either California arrest record or a moral waiver. In all AFQT categories, recruits with PLE have higher unsuitability attrition rates. He claimed that there is “little advantage in being more lenient in granting moral waivers to prospective recruits in the higher AFQT categories” (p. 47). In terms of education attainment, he found that high school recruits with PLE had 78% higher unsuitability discharge rate than others. This finding is consistent with the finding of Flyer (1995) which suggested that recruits with criminal background had 65% higher attrition rates than other recruits. Non-graduates with or without PLE had much larger unsuitability discharge rates than high school graduates — regardless of PLE status. This suggests that even though a high school diploma is an important predictor of attrition, having an arrest history increases the likelihood of unsuitability attrition — even for high school graduates. The study also finds greater unsuitability attrition rates among blacks with an arrest history than whites or Hispanics with an arrest history. Finally, the logit models used to analyze differences in waiver categories suggest that recruits with felonies have 20 percentage points higher unsuitability attrition rates; whereas, recruits with misdemeanors have 10 percentage points higher unsuitability attrition rates than recruits with no arrest history.

2. Moral Waivers — Unsuitability Attrition Relation

Hall (1999) analyzed the unsuitability attrition rate of Navy recruits with moral waivers. He identified key characteristics of those who attrite before completing their

first term. He used data from the Navy Recruiting Command (NRC), including enlisted accessions for fiscal years 95 and 96. In his analysis he employed logistic regression and classification trees. He found that recruits with moral waivers had a significantly higher unsuitability attrition rate (9.3% - 9.9%) than recruits without moral waivers. In addition, he found that recruits with moral waivers who were not high school graduates had higher unsuitability attrition rates. Even though he found significant unsuitable attrition rates of recruits with moral waivers, he did not recommend excluding those recruits due to recruiting problems at that time and excluding some recruits who will succeed. He also suggested that, along with moral waivers, not having a high school diploma exacerbating the unsuitable attrition should be considered.

Putka et al., (2004) investigated the effects of in-service deviance and unsatisfactory separation through the first 18 months of service. For the analyses, they used 2001 cohort data of enlistees shipped to basic training in all four services (80,944 enlisted members) between June 1, 2001 and September 30, 2001. Logistic regression analyses were performed to assess the relationship between conduct waiver status, 18 month attrition, and in-service deviance. They used both controlling and not controlling for demographic variables. The data did not capture soldiers who enlisted after the terrorist events of September 2001. Thus, their findings did not address the question of long-term trends in the attrition rates of recruits with conduct waivers or potential changes in these trends during war times. Also the data did not extend to the end of the first enlistment term. Thus, they could not investigate the first term enlistee-related attrition and reenlistment behavior.

Analyses were conducted at three levels: (a) the overall waiver level (e.g., law violation and drug/alcohol abuse waivers), (b) the waiver category level (e.g., minor traffic violations, juvenile felonies, and marijuana use), and (c) the level of authority required to approve the waiver. Analyses were conducted where the effects of demographic variables were and were not controlled. With regard to the authority level at which moral character waivers (MCWs) were approved, Putka et al. consistently found that individuals with waivers approved at the lowest approval authority level had significantly higher moral character-related (MCR) attrition rates than individuals

without MCWs. Another consistent finding across services was that MCR attrition rates among individuals who had MCWs approved at the highest authority levels (i.e., Highest Authority/Recruiting Command Headquarters) were not significantly different than rates among individuals without MCWs. MCW status and pre-service transgressions were related to both attrition for moral character-related reasons and incidents of in-service deviance. Including demographic variables in their models did not diminish the effect of the MCW status and pre-service transgressions on the attrition. Such findings suggest that, in general, the services can do a better job in terms of holding recruits who require MCWs to higher standards on alternative selection criteria (e.g., AFQT scores) in an effort to minimize their risk of attrition and in-service deviance (p. vi). When analyzing conduct waiver categories separately, the authors found that some types of conduct waivers yielded higher attrition related to moral character. This means that conduct waiver recruits were not completing their first 18 months due to problems that were closely related to those that triggered a waiver. The authors observed that individuals with conduct waivers for non-traffic, adult felonies, marijuana use, positive drug or alcohol tests, or multiple waivers were significantly more likely to attrite for reasons directly related to such behavioral problems than individuals without waivers (p. 32). On the other hand; MCR attrition rates for individuals who received waivers for traffic violations (minor or serious) were not significantly different from individuals without MCWs (p. 111).

In his study, Boucai (2007) reviewed various studies about unsuitability attrition. He concluded that although recruits with criminal background (stands for moral waivers) had significantly higher probability unsuitability attrition, the difference between ex-offenders and non-offenders was almost always less than 10%; it did not mean that recruits with criminal background were unsuitable for military service. Such correlation between attrition and criminal history also exists with other variables, such as race, education, and AFQT scores even more significantly (p. 25).

Jeppe (2008) studied the effect of moral waivers (and other factors that mitigate or exacerbate the effect of moral waivers) on the unsatisfactory attrition of Marines. He used the Marine Corps data drawn from the Total Force Data Warehouse for fiscal years

1997-2005. The number of the waivers in the Marine Corps is more than for other services. This is because of the strict drug use policy which requires a waiver for even one time marijuana use. In his sample, 34.9% of recruits had a substance abuse waiver and a total of 51.8% of recruits had a conduct waiver. The study found no systematical differences in the observable characteristics of recruits with waivers and those without waivers. There were few exceptions. In particular, males were more likely to have moral waivers; recruits with moral waivers tended to have shorter stays in the DEP (Delayed Entry Program). A probit regression model was used to capture unsatisfactory service separation. The base case was an 18-year old white male with no waivers, educational Tier I, and AFQT Category I. According to the regression results, a recruit with moral waiver has a 32.9% higher probability of unsatisfactory service separation compared to the base case. Jeppe also investigated differences in the type of moral waivers and revealed that minor moral waivers (traffic and minor law infractions) had a statistically insignificant effect on the probability of unsatisfactory separations. When serious offenses and substance waivers were analyzed, however, both categories significantly increased the probability of unsatisfactory separation. Finally, the study found that a recruit with a substance waiver was 44.7% more likely to separate for substance-related reasons. The study also revealed that recruits with serious offense waivers were 32.4%, marijuana waivers had a 26.6% more probability of substance-related separations. Based on these findings, Jeppe recommended a policy that would allow for a faster separation of individuals that come in with moral waivers to decrease the negative effects of unsatisfactory service separations. Also, he argued the necessity of providing additional counseling for the recruits with conduct waivers as well as establishing a personality and physiological test which may allow identifying more characteristics of recruits.

In summary, Hall (1999) found that recruits with moral waivers were 10% more likely to separate from unsuitability reasons during their first term. Putka et al., (2004) suggested that recruits with moral waivers were more likely to attrite for reasons directly related to their behavioral problems in their first 18 months. Their most important finding, however, is in the differences among the authority levels of moral waivers in which they found that waivers approved at the lowest approval authority level had

significantly higher moral character-related attrition rates than individuals without moral waivers. Jeppe observed the moral waivers beyond the first term of recruits and found that recruits with moral waivers were about 33% more likely to attrite because of unsatisfactory service. This difference in Jeppe's study could be due to the differences in coding of the unsuitability attrition or unsatisfactory service. All of these studies suggest that there is a strong correlation between the conduct waiver status and attrition because of unsuitability reasons. Also, they suggest that having a high school diploma has a mitigating effect on the unsuitability attrition which is in accordance with the "whole person" policy.

3. Moral Waivers — Attrition Relation

Later studies either considered general attrition more than attrition or they investigated both of them but focused primarily on general attrition. Putka & Strickland (2005) analyzed the FY99 enlistment cohort for the purpose of predicting first term attrition. Since 9/11, there have been substantial changes in the recruiting environment: results based on the FY99 cohort might not generalize to cohorts recruited in more recent years; thus, a new cohort, the FY03 cohort, is followed from entry to completion of training. To allow a reasonable comparison, many of the same instruments and same procedures used in the FY99 cohort are also used in the FY03 cohort. After the analyses, the authors find that the demographic composition of the FY99 and FY03 cohorts are very similar. They also find that the base rates and composition of Basic Combat Training (BCT) attrition in the FY99 and FY03 cohorts are quite similar. Their findings suggest that BCT attrition model obtained using data from the FY99 cohort maintains its validity and utility for predicting BCT attrition in the FY03 cohort. They compare BCT attrition rates of soldiers in the FY99 cohort and the FY03 cohorts. In both cohorts, soldiers who require medical enlistment waivers for entry into service are more likely to attrite than soldiers without such waivers. In the FY03 cohort, soldiers with medical enlistment waivers are 1.79 times more likely to attrite in BCT than soldiers without such waivers; whereas, in the FY99 cohort, soldiers with medical enlistment waivers are only 1.33 times more likely to attrite in BCT than soldiers without such waivers. Soldiers with moral conduct waivers in the FY03 cohort are 2.25 times less likely to attrite in BCT than

soldiers without such waivers; whereas, in the FY99 cohort, soldiers with moral character waivers are only 1.05 times less likely to attrite in BCT than soldiers without such waivers (p. 26).

The findings on moral character waivers attrition are directly opposed to all prior studies. It should be noted, that, due to data limitations, the authors could not follow the recruits for a long period of time. Thus, they only focused on BCT (Basic Combat Training) attrition. The authors admit that examining later attrition in the FY03 cohort would also be important in light of potential differences between cohorts that may emerge once soldiers join their unit.

Huth (2007) followed up on the study by Hall (1999) with recent data. This coincided with changes in the moral waiver policies. In particular, the identification of recruits with moral waiver is easier for the more recent cohorts. He investigated the relationship between moral waivers and long-term success of Navy enlistees. His dataset consisted of two cohorts of recruits (2003-2004) provided by NRC, DMDC, and internal waiver logbook of NRC (Navy Recruiting Command) Nashville. Initially he found that recruits with moral waivers were less likely to attrite from the DEP. For long-term success, which is defined as completing DEP and surviving until the end of available data, he looked at the survival of applicants beginning from the DEP entry and the survival of applicants who already completed DEP. He found that sailors with moral waivers had 32% lower long-term success than other recruits. He also found that having a high school diploma, being in test score category 1 (AFQT score between 93 and 99), being male, and having prior service were the strongest predictors of success. Finally, he recommended mitigating the affect of moral waivers in long-term success with high academic standards. This is already being used by military officials in terms of “whole person” policy.

Distifeno (2008) investigated the effect of moral waivers on first term attrition of U.S. Army soldiers. In his study, he analyzed attrition at 6 months, one year, and at the end of first term in all U.S. Army recruits who entered between the years 2000-2006. He used multivariate analyses, ordinary least squares (OLS), and probit regression models. He also used a survival analysis to investigate whether conduct waivers affect the

duration of survival during the first term enlistment contract. He found that, in the 6 month and one year periods, recruits with moral waivers attrite less than other recruits by 20% and 11%, respectively. At the end of first term, however, recruits with moral waivers attrite more than other recruits (4 percentage points, or 12.5%, higher). These findings are consistent with Putka and Strickland, who also found lower attrition rates in the short run for moral waiver recruits. Distifeno also investigated differences among six moral waivers categories: felonies, serious non-traffic, minor non-traffic, serious traffic, minor traffic, and drug waivers. He found that recruits with serious traffic and minor-non-traffic waivers had lower rates of early and late attrition. On the other hand, serious non-traffic and felony waivers, which make up the largest percentage of moral waivers, had lower short-run attrition rates. This was followed by higher long-run attrition rates. He further measured the relationship between substance abuse attrition and conduct waivers. He found that recruits with drug waivers had 200% higher probability of substance attrition than recruits without any type of waivers. He also found higher probability of substance abuse attrition in the other types of moral waivers. He suggested that the increase in the attrition after the one year period is mostly because the soldiers are being released from the controlled training environment. His study recommended following up on moral waiver soldiers — either formally through counseling or informally through extra attention and supervision by superiors. His recommendation, however, of assigning first-term marker tag to recruits with moral waivers seems hard to implement: it may be seen as a burden for leaders and recruits with moral waivers may feel isolated. While Distifeno provided useful insights into the conduct waiver-attrition relationship, he was not able to capture the relationship between conduct waivers and attrition reasons thoroughly. He focused only on the substance attrition-substance waiver relationship, but he omitted other types of misconduct discharges.

C. LIMITATIONS

Most of the studies — especially the older ones - are affected by the problems in the enlistment screening problems that are not related to DoD. They are also affected by

non-standardization of the processes among the services and lack of complete data or databases. Here, we focus on these limitations based on studies that focus solely on these problems and studies which mention them briefly.

1. Shortcomings in the Screening Process of Recruits with Conduct Waivers

Early attrition is the biggest problem of the military. This is because services make a substantial investment in recruits in the first months. If recruits attrite, there is no return on investment. Thus, to better identify the ones that should not be enlisted, the screening process should be improved.

Determining criminal history information is greatly encouraged. Services repeatedly query each applicant as much as 14 times during enlistment process (GAO Feb. 99). Even though concealing criminal history can result in dishonorable discharge for fraudulent enlistment, some recruits hide their criminal history. GAO indicated that “the services...are not able to obtain or substantiate all available criminal history information because service policies and federal, state, and local laws and policies...preclude access” (p. 2). Even though criminal history checks are done, it is limited. This is because checks are conducted without using fingerprints; the services have limited access to criminal history information; and state and local governments sometimes charge fees. To address these problems, this thesis provides recommendations, such as making fingerprint search available for recruiters and not sending enlistees to training and to first-duty stations without having all available criminal history.

2. Non-Standard Applications Across Services and Lack of Data

DoD has a list of separation codes and definitions to standardize the services’ use of these codes. Implementation of these separation codes, however, differs in some points across service. This is because DoD did not issue an implementation guideline. Also, the use of moral waiver sub-categories across services and qualifications for categories are not standard. The Army and the Marine Corps do not use the “minor misdemeanor” category — only the Marine Corps use the “serious traffic” category. The Navy and the Air Force can qualify more than one felony offense for waiver; whereas, the Army and

Marine Corps allow only one felony offense. The GAO report (2007, January) recommended that DoD should standardize the usage of separation and medical diagnostic codes across services. This would provide more robust data for future studies.

Because of these non-standard applications, some researchers, e.g., Hall (1999) and Huth (2007)) obtained and merged different data sources to better identify recruits with moral waivers. They had difficulties in comparing the findings of their studies with the previous ones. On the other hand, Flyer (1995) and Frabutt (1996) did not use the moral waiver codes of recruits; rather, they obtained criminal history data of the recruits in some states and analyzed the unsuitability attrition rates according to this representative sample.

These non-standard applications have been standardized after 27 June 2008 DoD Memorandum: the moral waivers title was replaced by “conduct waivers” and sub-categories are standardized as major misconduct, misconduct, non-traffic offenses, and traffic offenses. Qualifications for these categories are also standardized across the services. Since the new coding is not available yet and the data this thesis uses is based on old coding, old coding is used in this study to compare the findings with the existing studies in the literature.

D. FOCUS AREA OF OUR STUDY

In all prior studies, the attrition and performance of conduct waiver recruits is compared with that of high quality recruits. The implicit assumption is that high quality recruits are the next best alternative. When the labor markets are tight, however, or when recruiting environments are more difficult, the next best alternative does not include a high quality recruit, but, rather, a recruit who perhaps falls short in educational attainment or AFQT scores. This study compares recruits with conduct waivers to other less-than-ideal recruits. For the purposes of this comparison, this thesis defines a less than ideal recruit as one who has below average AFQT scores and/or less than a high school diploma. The measure of performance used is attrition rates, both in the short and long run. This is similar to previous studies. It will also look at sub-categories of conduct waivers and decide if some conduct categories are more problematic than others. Finally,

this study looks at the reasons for attrition and decides if having a conduct or drug waiver increases the chances of unsuitability attrition — especially from the reasons related to the waiver.

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III. DATA AND METHODOLOGY

A. DATA DESCRIPTION

We use the same data employed by Distifeno (2008). The dataset consists of all enlisted accessions in the Army between fiscal year 2000 and fiscal year 2005. The sample includes 458,825 individuals who are tracked until year 2007. The data was provided by the Defense Manpower Data Center (DMDC). The data was primarily derived from United States Military Entrance Processing Command (MEPCOM) enlisted personnel data files of new U.S. Army recruits. This data file provides an initial snapshot of each individual collected during initial processing at recruitment centers and military entrance processing centers. The dataset also includes information concerning the discharge status and date of individuals who separate.

This study follows the same sample restrictions as Distifeno and focuses on enlistees who signed three- or four-year contracts, are between 17 and 42, and came in at the rank of E-4 or lower. In addition to these restrictions, this thesis drops the individuals who have prior service history, who are believed to be very different from the average new recruit in background and attachment to the military. Individuals with missing or erroneous key demographic characteristics are also dropped. Finally, this study drops individuals with AFQT scores lower than 15. We believe that these are most probably erroneous entries. These restrictions reduce the sample size to 257,396 observations. Table 1 summarizes the sample restrictions and the resulting sample size.

Table 1. Summary of the sample restrictions

Reason for Dropping	Number Removed	Explanation
Starting Sample Size	458,825	
Contract Length	102,048	Restricted sample to only 3- and 4-year contracts.
Age Greater than 42 & Rank above E-4	14,278	Removed individuals outside the standard enlistment age and rank above E-4.
Prior Enlistment	32,108	Removed individuals who have prior service history.
White, dependents. and Rank	27,569	Removed individuals whose key demographic characteristics are missing.
Education Level	24,278	Removed individuals whose education levels are unknown.
AFQT Score Less Than 15	1148	Removed individuals whose AFQT scores are less than 15.
Total Removed From Sample	201,429	
Sample Size	257,396	

B. KEY VARIABLES

Based on the literature reviewed earlier, this study identifies the contributing factors to attrition. Then the effect of these key variables on attrition and on behavior-related attrition is investigated.

1. Dependent Variables

For this study, attrition at three different points in time is examined: 180-day, 365-day, and first term. Inter-service separation codes are used to determine if a separating soldier is counted as an attrition loss or is considered a non-attrition loss. The separation due to personality disorders, entry-level performance or unsatisfactory performance, failure to meet weight or body fat standards, alcoholism, drug usage, or court conviction are classified as attrition loss. On the other hand, separations due to retirement, expiration of term of service, immediate reenlistment, death, early release to

attend school, or early release in the national interest are considered as non-attribution losses. Appendix A includes a complete listing of the separation codes contained in the sample and how they are used to define the attrition variables.

180-day Attrition: This is a dummy variable where 1 represents a soldier who did not complete 180 days of active service. The 180-day attrition models contain 257,396 observations.

365-day Attrition: This is a dummy variable where 1 represents a soldier who did not complete one year of active service. The 365-day attrition models contain 257,396 observations.

First Term Attrition: This is a dummy variable where 1 represents a soldier who did not complete the contracted amount of active service of either three or four years. Soldiers who have entry dates during fiscal years 2003, 2004, and 2005, are not included in these models because they did not have an opportunity to complete their entire three- or four-year contracts. This eliminates many observations from the analysis. Models investigating first term attrition contain 120,541 observations.

Unsuitability Attrition: For the purpose of examining unsuitability attrition behavior of recruits in the sample, we define 4 categories unsuitability attrition, behavior-related attrition (broad), behavior-related attrition (narrow), and substance abuse attrition. Unsuitability attrition is the broadest category. Unsuitability attrition is a dummy variable where 1 represents a soldier who received any unsuitability attrition-related discharge before contract completion. This includes all attrition categories related to character or behavior disorders: commission of a serious offence, unsatisfactory performance, unsuitability to the service, fraudulent entry, failure to meet minimum qualifications for retention, civil court conviction, court martial, dropped from strength because of imprisonment or desertion, homosexuality, sexual perversion, drug usage, or alcoholism. Appendix A provides the detailed list of separation reasons defined as unsuitability attrition. This variable contains 29,366 observations. In the sample, 34,174 observations attrited before contract completion and 29,366 of them are unsuitability attrition.

Behavior-Related Attrition: This is a dummy variable where 1 represents a soldier who received a behavior-related discharge before contract completion. Behavior-Related attrition includes all attrition categories related to unsuitability attrition except security, homosexuality, sexual perversion, good of the service (discharge in lieu of court material), failure to meet minimum qualifications for retention, and unsatisfactory performance. We believe that these attrition reasons are not directly related to the behavior-related attrition. This study defines two kinds of behavior-related attrition — narrow and broad. The broad behavior-related attrition includes attrition due to character or behavior disorder, commission of a serious offence, civil court conviction, court martial, dropped from strength because of imprisonment or desertion, drug usage, or alcoholism. The narrow behavior-related attrition includes all the attrition reasons that fall into the broad category — except drug and alcoholism-related attritions. Appendix A provides the detailed list of separation reasons defined as narrow or broad behavior-related attrition. While narrow behavior-related attrition variable contains 20,967 observations, broad behavior related attrition variable contains 26,583 observations.

Substance Attrition: This is a dummy variable where 1 represents a soldier who attrites because of drug or alcohol use. In this study's sample, 8,024 recruits attrited due to substance use.

2. Independent Variables

This study reviews the independent variables used in models and the expected effect of each variable on the dependent (attrition) variables.

a. Demographic Variables

This thesis includes the demographic variables, such as gender, race/ethnicity, marital status, dependents (the number of dependents a soldier claimed at time of entry), rank (the soldier's assigned rank at entry), and age in the models. Most studies in the literature show that these demographic variables have important and significant effects on attrition. Age-squared is also included in the models to capture any non-linear effects of age on attrition. We believe that the effect of age on attrition diminishes over time.

b. Education and Ability Variables

To investigate the effect of education on attrition, we separate education into three categories: Non-High School Degree Graduate, High School Degree Graduate, and More Than High School and created dummy variables for these categories. The Non-High School Degree Graduate variable takes a value of 1 if the soldier dropped out of high school or did not receive a traditional high school diploma. This includes GED-recipients and those who obtained other forms of high school accreditation, such as correspondence school diploma, occupational program certificate, test-based equivalency diploma, high school certificate of attendance, completed high school, but no diploma, and other non-traditional high school credentials. Soldiers who received high school diplomas or obtained additional years of education (which range from some college to post-secondary degrees), receive a value of zero for this variable. Appendix B provides the detailed list of education levels and their proportion in the data, as well as the detailed classification of recruits into the three education categories. The authors expect that non-high school graduates will have higher attrition rates; therefore, this variable will have a positive effect on attrition. The More Than High School dummy variable contains a broad range of educational credentials. In particular, this study includes individuals who hold associate, baccalaureate, master, or doctorate degrees. Individuals in this category represent only 8.09% of the sample. It should be noted that in the sample only 0.02% have a doctorate degree; 0.3% have a master's degree; 3.4% have baccalaureate degrees, and the rest of the More Than High School are associate degree holders or completed one semester of college without having a high school diploma. Table 2 details the number and percentages of each type of education categories in the sample.

Table 2. Education categories in the sample

Education Category	Frequency	% of Sample
Non-High School Degree Graduate	45,016	17.49%
High School Degree Graduate	191,544	74.42%
More Than High School	20,836	8.09%

The Armed Forces Qualification Test (**AFQT**) score will be used as a proxy for the ability of the recruit. The AFQT variable represents the soldier's percentile score from this test. To investigate the effect of AFQT score on attrition, we separate AFQT scores into two categories: low AFQT (AFQT score<50) and high AFQT (AFQT score≥50). Prior studies have found that AFQT is inversely related to attrition. We expect that individuals who have lower AFQT scores will have higher attrition rates; therefore, Low AFQT will have an increasing effect on the attrition.

Waiver Variables: The Army routinely grants waivers to take in recruits who have criminal records, medical problems, or low aptitude scores that would otherwise disqualify them from service. These recruits with waivers are classified as conduct waivers, medical waivers, and other waivers. Most are conduct waivers, which include minor traffic waiver, serious traffic waiver, minor non-traffic waiver, serious non-traffic waiver, drug waiver, and felony waiver.

Conduct Waiver: Dummy variables take a value of 1 for those who need conduct waivers upon enlistment. Dummy variables were generated based on the waiver codes provided in the dataset. The conduct waiver dummy variables generated are as follows: **Conduct Waiver** for all combined waivers that qualified under the conduct aspect, **Minor Traffic Waiver** for all minor traffic waiver; **Serious Traffic Waiver** for all serious traffic waivers; **Minor Non-Traffic Waiver** for all minor non-traffic waivers; **Serious Non-Traffic Waiver** for all serious non-traffic waivers; **Felony Waiver** for all waivers that involved a felony conviction; and **Drug Waiver** for both self-reported and drug screening drug use. For variable creation, the original DMDC variable name of **MORAL_WAIVER** will be used and meant to stand for conduct waivers. Appendix C lists each waiver code included in the sample.

Medical Waiver: A dummy variable represents recruits who require medical waivers to enlist. These waivers are issued for pre-existing medical conditions that would normally block individuals from enlistment. Additionally, medical waivers may be assigned for recruits who do not meet height and weight requirements. The variable takes a value of 1 if a person needs a medical waiver at enlistment. Historically,

soldiers who enlisted with medical waivers showed higher attrition rates. For this reason, we expect these types of waivers will be associated with higher attrition.

Other Waiver: In some cases, recruits need waivers that are not medical or conduct in nature. These waivers are issued for such things as too many dependents, having a military spouse, receiving a low AFQT score, or being a conscientious objector. These recruits are grouped into the Other Waiver category. Prior studies have found that this variable is related to attrition. Some studies, however, have found that it has a positive effect on attrition, and some studies have found that it has a negative effect on attrition.

No Waiver: For soldiers who needed no waivers to enlist, a dummy variable was created. The authors hypothesize that this group will have lower attrition rates.

c. Defining Treatment and Control Groups

To compare enlistees' attrition behavior and decide from which group to choose recruits to meet the recruiting goals, the authors created subcategories that combine cognitive ability with waiver status. Table 3 details the number and percentages of each so-defined subgroup. We find that 47.3% of the recruits are high quality recruits (no conduct waiver, high school graduate, high AFQT(>50))

Table 3. Subcategories in the sample

Subcategory	Number	% of Sample
No conduct waiver, high school graduate or above, high AFQT(>50)	121,682	47.27 %
No Conduct Waiver, High School Graduate, Low AFQT(<50)	73,997	28.75 %
No Conduct Waiver, Non-High School Graduate, High AFQT	28,141	10.93 %
No Conduct Waiver, Non-High School Graduate, Low AFQT	12,848	4.99 %
Conduct Waiver, High School Graduate, High AFQT	11,657	4.53 %
Conduct Waiver, High School Graduate, Low AFQT	5,044	1.96 %
Conduct Waiver, Non-High School Graduate, High AFQT	3,005	1.17 %
Conduct Waiver, Non-High School Graduate, Low AFQT	1,022	0.40 %
Total	257,396	100.00 %

d. Other Variables

This study also includes variables YP, JROTC, and ROTC that represent participation in various military-related youth or high school programs prior to enlistment. The authors believe that these variables reflect individuals' standpoints to military service and their motivation to serve for the military. We further believe that these programs will have a small negative effect on attrition. We also believe that contract length has an important effect on attrition; thus, this variable is included in this study's models. Perhaps longer contracts are harder to complete and may be associated with higher attrition. For the purpose of capturing cohort differences due to changes in economic conditions or other factors that affect all individuals within the same cohort similarly, all this study's models include dummy variables for the year the cohort entered the Army.

C. DESCRIPTIVE STATISTICS

The descriptive statistics for the model variables are provided in Table 4. This table shows the number of observations, the mean, and the standard deviation. About 82% of the sample is male; 63% is white; 18.8% is African American; 13.7% is Hispanic; and 4.4% belongs to the other-race category. 17.5% of enlistees in the sample are non-high school graduates; 74.4% are high-school graduates; and only 8.1% are more than high school educational credential holders. Additionally, around 13% of the enlistees are married.

Table 4. Descriptive statistics of model variables

Variable	Observations	Mean	Std. Dev.
Outcomes	257,396		
180-day Attrition	257,396	0.095	0.293
180-day Attrition	257,396	0.132	0.339
First Term Attrition	120,541	0.284	0.451
Unsuitability Attrition	129,433	0.227	0.419
Behavior Related Attrition (Narrow)	129,433	0.162	0.363
Behavior Related Attrition (Broad)	129,433	0.205	0.404
Substance Abuse Attrition	129,433	0.043	0.204
Explanatory Variables			
Male	257,396	0.821	0.384
Age	257,396	20.523	3.263
White	257,396	0.631	0.482
Black	257,396	0.188	0.391
Hispanic	257,396	0.137	0.343
Other Race	257,396	0.044	0.205
AFQT	257,396	57.820	18.674
Low AFQT	257,396	0.361	0.480
High AFQT	257,396	0.639	0.480
NHS	257,396	0.175	0.380
HS	257,396	0.744	0.436
MHS	257,396	0.081	0.273
YP	257,396	0.001	0.029
ROTC	257,396	0.004	0.059
JROTC	257,396	0.031	0.172
Married	257,396	0.130	0.336
Rank	257,396	1.725	0.925
Dependents	257,396	0.252	0.695
Conduct Waiver	257,396	0.081	0.272
Medical Waiver	257,396	0.053	0.224
Other Waiver	257,396	0.011	0.102
FY2000	257,396	0.142	0.349
FY2001	257,396	0.160	0.367
FY2002	257,396	0.166	0.372
FY2003	257,396	0.153	0.360
FY2004	257,396	0.196	0.397
FY2005	257,396	0.182	0.386

In both the 180- and 365-day attrition, there are 257,396 observations, but, in the first term attrition, there are only 120,541 observations. This is because many of the individuals did not have an opportunity to reach their end-of-contract, but they did pass the one-year point.

Also listed in Table 5 are the mean values for each variable. 9.5% of the sample attrited in first 6 months; 13.2% of the sample attrited in the first year; 28.4 of the restricted sample attrited before the contract completion; and 22.7% of the sample attrited because of unsuitability reasons.

1. Demographic Characteristics of Army Recruits

In this section, this study analyzed the data to investigate whether or not the key demographic characteristics of the Army accessions between fiscal year 2000 and fiscal year 2005 changed over time. This study investigates the proportion of the race categories represented in the accessions. Later, this study investigates the proportion of the waiver categories in data that have accessions.

While the percentage of whites enlisting has increased from 58.5% in 2000 to 67.9% in 2005, applicants reporting to be African-American have rapidly decreased from 24.4% in 2000 to 14.7% in 2005. Another trend is the increase in other race enlistees, a number that has increased from 3.9% in 2000 to 4.8% in 2005. Table 5 displays the percent of accessions by race.

Table 5. Percent of accessions by race

	2000	2001	2002	2003	2004	2005	Total
White	58.5%	59.5%	63.3%	62.9%	65.1%	67.9%	63.1%
Black	24.4%	23.7%	18.3%	17.2%	16.4%	14.7%	18.8%
Hispanic	13.2%	13.1%	14.3%	15.3%	13.5%	12.7%	13.7%
Other Race	3.9%	3.8%	4.1%	4.6%	5.0%	4.8%	4.4%

Another key accession characteristic is the amount of waivers in the accessions. Table 6 displays the percent of accessions by waiver status. Applicants that required some form of policy waiver to enter the Army from 2000 to 2005 represent 14.40% of all accessions. Applicants requiring conduct waiver to enlist have notably increased from 5.5% in 2000 to 10.3% in 2005. Additionally, applicants requiring medical waivers to enlist have increased slightly over the years. Applicants requiring other waiver to enlist have increased from 1.0% in 2000 to 1.8% in 2005. The amount of non-high school graduates in the sample has increased from 16% in 2000, to 20.1% in 2005. These numbers imply that Army recruiters need to increase the amount of waivers in accessions in recent years to meet the recruiting goals.

Table 6. Percent of accessions by waiver status

	2000	2001	2002	2003	2004	2005	Total
Conduct Waiver	5.5%	7.2%	9.5%	8.3%	7.2%	10.3%	8.1%
Medical Waiver	4.6%	4.4%	4.6%	4.8%	5.9%	7.0%	5.3%
Other Waiver	1.0%	1.0%	1.0%	0.8%	0.7%	1.8%	1.1%
Any Kind of Waiver	11.1%	12.7%	15.2%	13.9%	13.7%	19.1%	14.4%
No High School Diploma	16.0%	18.1%	17.9%	16.7%	15.8%	20.1%	17.5%
Low AFQT	39.1%	39.2%	34.3%	33.2%	33.8%	37.5%	36.1%

2. Conduct Waivers

Of the 257,396 individuals in the sample, 20,728 individual, or 8.1%, received conduct waivers prior to enlistment. Table 7 details the number and percentages of each type of conduct waiver issued. The vast majority of these (50.5%) are Serious Non-Traffic Waivers; the second-largest group is Drug Waivers (18.4%); and the third-largest group is the Felony Waivers (17.9%). These three waiver groups make up about 87% of all conduct waivers. Also, 0.2% of the whole sample, or 2.3% of the conduct waivers, possesses more than one type of conduct waiver.

Table 7. Conduct waiver percentages for FY2000 through FY2005

	Number	% of Sample	% of Conduct Waivers
Total	257,396	100.00%	N/A
Conduct Waiver	20,728	8.05%	100.00%
Drug Waiver	3,810	1.48%	18.38%
Minor Traffic (MT) Waiver	72	0.03%	0.35%
Serious Traffic (ST) Waiver	1,547	0.60%	7.46%
Minor Non-Traffic (MNT) Waiver	660	0.26%	3.18%
Serious Non-Traffic (SNT) Waiver	10,463	4.06%	50.48%
Felony Waiver	3,703	1.44%	17.87%
Multiple Conduct Waivers	473	0.18%	2.28%

3. Waivers by Race and Ethnicity

We further investigate differences in conduct waivers, education status, and AFQT category by race. Table 8 presents the percentages of waivers by racial category and by fiscal year. Over the 6 years examined, an average of 9.38% of whites needed conduct waivers to enlist; whereas, only 5.73% of black recruits, 5.86% of Hispanics, and 5.83% of other-race recruits required such a waiver. As illustrated in Table 8, through all years in the sample, white carry a higher percentage of conduct waivers than non-whites. Also, the proportion of the sample with waivers has increased evenly across all four race/ethnic groups over the years observed. All groups seem to nearly double their number of conduct waivers between 2000 and 2005.

Table 8. Conduct waiver, educational credentials and AFQT status by race

	Fiscal Year						
White	2000	2001	2002	2003	2004	2005	2000-2005
Conduct Waiver	6.6%	8.2%	11.2%	9.7%	8.2%	11.6%	9.4%
No HS Diploma	19.5%	21.7%	21.3%	19.7%	18.2%	22.3%	20.4%
Low AFQT	27.5%	28.6%	23.9%	22.6%	24.9%	29.6%	26.2%
Black	2000	2001	2002	2003	2004	2005	2000-2005
Conduct Waiver	3.6%	5.7%	6.8%	5.8%	5.7%	7.2%	5.7%
No HS Diploma	9.4%	11.1%	10.7%	11.1%	10.6%	14.8%	11.1%
Low AFQT	58.0%	56.8%	56.0%	56.5%	55.9%	58.9%	57.0%
Hispanic	2000	2001	2002	2003	2004	2005	2000-2005
Conduct Waiver	4.0%	5.0%	6.4%	6.0%	5.0%	7.7%	5.9%
No HS Diploma	13.7%	15.3%	13.4%	12.5%	12.7%	17.0%	14.1%
Low AFQT	54.0%	53.6%	50.8%	48.9%	47.7%	52.9%	51.1%
Other Race	2000	2001	2002	2003	2004	2005	2000-2005
Conduct Waiver	4.9%	5.6%	7.0%	6.1%	4.5%	7.0%	5.8%
No HS Diploma	13.7%	14.6%	14.5%	11.4%	11.3%	14.2%	13.1%
Low AFQT	43.5%	46.1%	42.1%	38.4%	40.1%	44.2%	42.2%

An average of 20.4% of white recruits are non-high school graduates; whereas only 11.1% of black recruits, 14.1% of Hispanics, and 13.1% of other-race recruits are non-high school graduates. On the other hand, only 26.2% the white recruits have low AFQT scores (<50); whereas 57% of black recruits, 51.1% of Hispanics, and 42.2% of

other-race recruits have low AFQT scores. When we compare white recruits with non-whites, we can realize that in terms of AFQT scores, white recruits are better than non-whites, however the proportion of non-high school graduates is higher in white recruits. Blacks tend to have lower rate of non-high school graduates but more than half of them have low-AFQT scores likewise Hispanics and other race categories. We can see that the whole person policy is in effect in compensating the negative effect of not having a high school diploma or low AFQT scores in the race categories.

4. AFQT Score and Education by Waiver Status

Prior studies in the literature have found that AFQT score is inversely related to attrition. It is expected that individuals who have higher AFQT scores will have lower attrition rates; therefore, this variable will have a positive effect on attrition. The first and second row of Table 9 presents the average AFQT scores by waiver status across the years in the sample. Recruits with conduct waivers consistently score higher (2.5 to 3 points higher) on the AFQT than recruits with no waivers.^{2nd} and ^{3rd} row of the Table 9 presents the percent of the non-high school graduate recruits by waiver status across the years in the sample. While 17.6% of the sample are non-high school graduates and enlisted without any kind of waiver, 19.4% of the sample are non-high school graduates and enlisted with a conduct waiver. The proportion of the non-high school graduates in the conduct waiver category seems to be bigger than the no-waiver category. It is noteworthy that this is only valid until 2004, but after 2004 the proportion of the non-high school graduates in the conduct waiver category is smaller than the no waiver category. These numbers show that, in accordance with the “whole person” policy, Army is trying to mitigate the effect of a waiver by increasing their AFQT score, and education standards. Also from the table all groups seem to increase the average AFQT scores around 2 points between 2000 and 2005. We know that all racial groups seem to nearly double their number of conduct waivers between 2000 and 2005 (see Table 8). When the effect of increase in the AFQT scores of recruits with waivers combined with the effect of increase in the number of recruits with waiver, they have significant positive affect on the average AFQT scores of the whole sample. Average AFQT score of enlistees has increased from 56.1 in 2000 to 58.0 in 2005.

Table 9. AFQT scores and education by waiver status and cohort

	Fiscal Year						
	2000	2001	2002	2003	2004	2005	Total
Avg. AFQT of recruits without waivers	55.8	56.0	58.0	58.5	58.7	57.5	57.5
Avg. AFQT of recruits with conduct waivers	58.6	58.3	60.5	60.8	60.5	60.2	60.0
Percent of recruits without waivers who do not have a HS diploma	15.9%	18.0%	17.3%	16.6%	16.6%	20.8%	17.6%
Percent of recruits with conduct waivers who do not have a HS diploma	21.2%	22.9%	25.9%	20.1%	9.0%	18.5%	19.4%

5. Attrition by Conduct Waiver, HS Diploma, and AFQT Score Status

Table 10 provides the different attrition rates for the conduct waiver, no conduct waiver, high school graduate, non-high school graduate, high AFQT, and Low AFQT group. Table 10 indicates that recruits with conduct waivers have consistently lower attrition rates than recruits without waivers for the initial 180 days and first year of enlistment. By the end of the first term, however, soldiers without conduct waivers have lower attrition rates. Also recruits with conduct waivers have consistently higher attrition rates for the unsuitability and the substance related attrition than recruits without conduct waivers. In terms of high school diploma status, non-high school graduates are more likely to attrite (compared to high school diploma or more) for all attrition categories. Recruits with low AFQT scores are also more likely to attrite in all attrition categories but the effect of AFQT scores are not as much as high school diploma status. These findings suggest that educational credentials, conduct waiver status and AFQT scores are good predictors of attrition.

Table 10. 180-day, 1 year, and full term attrition rates of soldiers with and without conduct waivers

	180-day Attrition	365-day Attrition	First Term Attrition	Unsuitability Attrition	Subs. Use Attrition
Conduct Waiver	7.7	11.7	30.9	33.4	10.4
No Conduct Waiver	9.7	13.4	28.2	21.7	3.8
No HS Diploma	14.0	19.3	39.9	32.6	5.9
HS Diploma or More	8.6	12.0	25.9	20.2	4.0
Low AFQT (<50)	10.5	14.3	29.0	24.3	4.4
High AFQT(>=50)	9.0	12.7	28.0	21.8	4.3

In the next chapter, this study employs multivariate data analysis to analyze 6 month, one year, first-term, and unsuitability attrition. We examine the attrition rates of recruits with less-than ideal qualifications, which include recruits enlisted with waivers, without high school diploma, or with low AFQT scores in the U.S. Army. Further analysis is made to determine whether there is a difference in attrition rates among the sub-categories of waivers. The analysis also captures the relationship between having a conduct and drug waiver and attrition from related reasons.

IV. MODELS & RESULTS

A. GENERAL ATTRITION MODELS

Probit regression models are used to determine the effect of the independent variables on attrition. This study analyzed the 180-day, 365-day, and first term attrition of the enlistees in the sample. Variables for demographics, education, ability, enlistment waiver status, and participation in a youth program are included in all three attrition models. Cohort dummies are also included in the models to capture cohort differences. The control group is the same in all three attrition models. It includes recruits who join the Army without any waivers, are white males, have high school diplomas, have high AFQT scores ($AFQT \geq 50$), are not married, have no dependents, and did not participate in youth programs or JROTC.

We estimate the model coefficients for both the restricted sample and the unrestricted sample for the 180-day and 365-day attrition. As a reminder, the restricted sample includes individuals who were followed long enough to observe their entire first term history. Therefore, the 180- and 365-day attrition models contain 257,396 observations (the unrestricted sample); the first term attrition models include 120,541 observations (the restricted sample). This study also estimates short-run attrition models with the restricted sample to facilitate comparison of the same cohort of individuals for all attrition models. This allows investigation into whether this study's estimates are due to the timing of attrition or due to cohort effects.

This study develops two different models for restricted and unrestricted sample in all three attrition levels. In the 1st model, in both unrestricted and restricted sample, general conduct waiver variable is used. In the 2nd model, conduct waiver variable is replaced by six separate categories of conduct waivers. This study tabulates the estimated coefficients and their standard errors as well as the marginal probabilities of attrition for each control variable. The observed (sample) probability of attrition and the probability of attriting predicted by the model for an individual with average characteristics are provided at the bottom of each table.

1. 180-Day Attrition

Table 11 presents the findings for the effect of waivers on 180-day attrition. Also the findings for the effects of all variables included in the models are presented in Appendix D. The observed (sample) probability of attrition at 180 days, as well as the probability of attriting predicted by the model, is listed at the bottom of the table. Since they are very close to each other, it can be concluded that the models are accurately predicting attrition for both the restricted and unrestricted models. The results in the table indicate that the conduct waiver variable carries a significant negative sign (significant at 1%). This suggests that those with conduct waivers are less likely to attrite. The coefficient on having a conduct waiver is -0.014 for the unrestricted sample and -0.017 for the restricted sample. This means that for the unrestricted sample recruits with a conduct waiver, 14.7% have lower attrition rates than recruits without a conduct waiver. In the restricted sample, recruits with a conduct waiver have 15.8% lower attrition rates than recruits without a conduct waiver. Column 2 and 4 disaggregate the conduct waiver category in separate subgroups. The predicted effect of conduct waivers on 180-day attrition again appears to be negative for most subgroups — except minor traffic waivers for which the effect is insignificant. The minor traffic waiver category, however, contains only 72 observations. This could be the reason why the predicted effect appears insignificant.

When looking at the other type of waivers, it is seen that the probability of attrition in the first 6 months of service for a recruit with a medical waiver increases by 0.012 for the unrestricted sample and 0.017 for the restricted sample. This equals 12.6% for the unrestricted sample, and 15.8% for the restricted sample. For a recruit enlisted with other waivers, the probability of attrition increases by 0.012, which equals 12.6% for the unrestricted sample. Interestingly, attrition decreases by 0.015 which equals 14.0% for the restricted sample over a recruit with no waivers but this is not significant even at the 1% level.

Regression results indicate that educational credentials and AFQT scores are good predictors of attrition. The findings suggest that for the restricted sample Non-High School Graduates are 68% more likely to attrite and individuals who have more than high

school educational credentials are 25.2% less likely to attrite (compared to High School graduates). Another finding for the 180-day attrition is that recruits enlisted with low AFQT scores ($AFQT < 50$) are 23.3% more likely to attrite than recruits with high AFQT scores ($AFQT \geq 50$). Within the entire less-than ideal qualifications (educational credentials, AFQT score categories, and conduct waivers) that this study analyzed, it is seen that while lower educational credentials (no high school diploma), and low AFQT scores have an increasing effect on 180-day attrition, conduct waivers have a decreasing effect on 180-day attrition. Having no high school diploma has more increasing effect on attrition than the low AFQT scores.

In terms of demographic variables, females are 89.5% more likely to attrite while minorities are less likely to attrite. Blacks are 39%; Hispanics are 54%; and other race is 36% less likely to attrite compared to white recruits. Married individuals are 1.9% less likely to attrite, but it is not statistically significant even at the 5% level. On the other hand, older recruits are 11.2% more likely to attrite (for each year); individuals with dependents are 5.6% more likely to attrite (for each additional dependent); and recruits who participate in youth programs and JROTC are 44.7% and 12.1% less likely to attrite, respectively.

Table 11. The effects of waivers on first 180-day attrition

180-day Attrition	1st Model (Unrestricted)	2nd Model (Unrestricted)	1st Model (Restricted)	2nd Model (Restricted)
Low AFQT	0.124** (0.008) [0.020]	0.124** (0.008) [0.020]	0.141** (0.011) [0.025]	0.141** (0.011) [0.025]
No High School Diploma	0.303** (0.009) [0.054]	0.302** (0.009) [0.054]	0.362** (0.012) [0.073]	0.362** (0.012) [0.073]
More than High School Education	-0.117** (0.014) [-0.017]	-0.117** (0.014) [-0.017]	-0.171** (0.021) [-0.027]	-0.171** (0.021) [-0.027]
Conduct Waiver	-0.098** (0.014) [-0.014]	N/A	-0.103** (0.020) [-0.017]	N/A
Medical Waiver	0.076** (0.015) [0.012]	0.076** (0.015) [0.012]	0.095** (0.023) [0.017]	0.095** (0.023) [0.017]
Other Waiver	0.074* (0.032) [0.012]	0.073* (0.032) [0.012]	-0.090 (0.050) [-0.015]	-0.090 (0.050) [-0.015]
Drug Waiver	N/A	-0.052* (0.029) [-0.008]	N/A	-0.050 (0.037) [-0.008]
Minor Traffic Waiver	N/A	0.198 (0.171) [0.035]	N/A	0.270 (0.177) [0.055]
Serious Traffic Waiver	N/A	-0.266** (0.054) [-0.034]	N/A	-0.304* (0.122) [-0.043]
Minor Non-Traffic Waiver	N/A	-0.081 (0.068) [-0.012]	N/A	-0.163 (0.089) [-0.025]
Serious Non-Traffic Waiver	N/A	-0.084** (0.019) [-0.012]	N/A	-0.105** (0.028) [-0.017]
Felony Waiver	N/A	-0.130** (0.031) [-0.019]	N/A	-0.134** (0.043) [-0.021]

2. 365-Day Attrition

The 365-day attrition model is set up the same as the 180-day model. Table 12 details the probit regression outputs of waivers for the unrestricted and restricted sample of 365-day attrition models. The findings for the effect of all variables included in the models are presented in Appendix E. The sign of conduct waiver variable is still negative, but the effect is not as strong as 180-day attrition model. The conduct waiver effect is now reduced to -0.009 which equals 6.8% for the unrestricted sample. For the restricted sample, it is reduced to -0.013 which equals 9.3%. These effects are also significant at the

1% level. This would indicate that the effect of having a conduct waiver on attrition is diminishing over time. As in the 180-day model, the conduct waiver subgroups also yield similar results. This includes the minor traffic group. The only difference is that now the coefficient on the drug waiver subcategory turns positive. This change suggests that the probability of attrition for a person enlisted with a drug waiver increases by 0.013. This equals 9.8% for the unrestricted sample. For the restricted sample over a person with no waivers in 365-day attrition, this is increased by 0.007 which equals 5%.

Likewise, having a medical waiver still increases the probability of attrition for 180-day attrition. It can be seen that this increasing effect diminished the 365-day attrition. This increase is around 7.6% for the unrestricted sample and 11.5% for the restricted sample. On the other hand, having an “other waiver” increases attrition in the unrestricted sample; whereas, it decreases in the restricted sample. It is not significant, however, even at the 5% level.

The effect of educational credentials also corresponds with 180-day attrition model where having no high school diploma increases the probability of 365-day attrition, and more than high school education significantly decreases the probability of 365-day attrition. The findings suggest that for the restricted sample Non-High School Graduates are 63.8% more likely to attrite, and individuals who have more than high school educational credentials are 21.5% less likely to attrite (compared to High School graduates). Another finding for the 365-day attrition is that recruits enlisted with low AFQT scores ($AFQT < 50$) are 19.3% more likely to attrite than recruits with high AFQT scores ($AFQT \geq 50$). Within the entire less-than ideal qualifications (educational credentials, AFQT score categories, and conduct waivers) that this study analyzed, it is seen that while lower educational credentials (no high school diploma), and low AFQT scores have an increasing effect on 365-day attrition, conduct waivers have a decreasing effect on 180-day attrition. Having no high school diploma has more increasing effect on attrition than the low AFQT scores.

Table 12. The effects of waivers on first 365-day attrition

365-day Attrition	1st Model (Unrestricted)	2nd Model (Unrestricted)	1st Model (Restricted)	2nd Model (Restricted)
Low AFQT	0.107** (0.007) [0.022]	0.107** (0.007) [0.022]	0.125** (0.010) [0.027]	0.125** (0.010) [0.027]
No High School Diploma	0.328** (0.008) [0.075]	0.328** (0.008) [0.075]	0.372** (0.011) [0.089]	0.372** (0.011) [0.089]
More than High School Education	-0.104** (0.013) [-0.020]	-0.103** (0.013) [-0.020]	-0.154** (0.020) [-0.030]	-0.154** (0.020) [-0.030]
Conduct Waiver	-0.045** (0.012) [-0.009]	N/A	-0.064** (0.018) [-0.013]	N/A
Medical Waiver	0.048** (0.014) [0.010]	0.049** (0.014) [0.010]	0.073** (0.021) [0.016]	0.074** (0.022) [0.016]
Other Waiver	0.048 (0.030) [0.010]	0.048 (0.030) [0.010]	-0.087 (0.047) [-0.017]	-0.087 (0.047) [-0.017]
Drug Waiver	N/A	0.062* (0.025) [0.013]	N/A	0.032 (0.033) [0.007]
Minor Traffic Waiver	N/A	0.130 (0.166) [0.028]	N/A	0.204 (0.171) [0.048]
Serious Traffic Waiver	N/A	-0.222** (0.047) [-0.040]	N/A	-0.398** (0.120) [-0.066]
Minor Non-Traffic Waiver	N/A	-0.077 (0.062) [-0.015]	N/A	-0.176* (0.082) [-0.034]
Serious Non-Traffic Waiver	N/A	-0.043** (0.016) [-0.008]	N/A	-0.073** (0.026) [-0.015]
Felony Waiver	N/A	-0.105** (0.028) [-0.020]	N/A	-0.119** (0.040) [-0.023]

3. First-Term Attrition

First-term attrition models are set up the same as the previous 180- and 365-day attrition models. There are only restricted samples results because first term attrition can only be studied for the cohorts entering during 2000 through 2002. Table 13 shows the output for the probit regressions of waivers for the restricted sample of first term attrition models. The findings for the effect of all variables included in the models are presented in Appendix F.

Interestingly, we see that the partial effect of conduct waiver changes into a positive sign, and it is significant at the 1% level. The partial effect of conduct waiver is now 0.042. This suggests that the probability of attrition for a recruit enlisted with a conduct waiver increases by 14.8% over a person with no waivers in first-term attrition. When the sub categories were analyzed, it was seen that serious traffic waiver yields negative results. This suggests that individuals with serious traffic waivers have attrition rates that are 0.01 percentage points (or 3.5%) lower than recruits with no waivers. The other waiver categories yield negative results (increasing effect on attrition), but results are not significant at even the 5% level — except drug waivers. When the effect of drug waivers is analyzed, it can be seen that having a drug waiver increases the effect of attrition by 0.119 which equals 42%. Therefore, it can be concluded that the increase on the attrition of recruits with conduct waivers is largely because of the effect of drug waivers.

Medical waivers also yield negative results. This means that having a medical waiver increases the probability of attrition by 0.012 which equals 4.2% in first term attrition, but it is not significant at even the 5% level. The effect of other waivers on attrition is still negative in sign similar to the 180- and 365-day restricted sample. It is significant at even the 1% level. Having other waivers decreases the probability of attrition by 0.035 which equals 12.4%.

Regression results indicate that educational credentials and AFQT scores are good predictors of first-term attrition. The findings suggest that for the restricted sample Non-High School Graduates are 50.8% more likely to attrite and individuals who have more than high school educational credentials are 20.1% less likely to attrite (compared to High School graduates). Another finding for the 365-day attrition is that recruits enlisted with low AFQT scores ($AFQT < 50$) are 7.4% more likely to attrite than recruits with high AFQT scores ($AFQT \geq 50$). It can be concluded that entire less-than ideal qualifications (Non-High School graduates, Low AFQT scores, and Conduct Waivers) have an increasing effect on first-term attrition. Having no high school diploma has more increasing effect on attrition than the low AFQT scores, and the conduct waivers.

Table 13. The effects of waivers on first term attrition

First Term Attrition	1st Model	2nd Model
Low AFQT	0.064** (0.008) [0.021]	0.064** (0.008) [0.021]
No High School Diploma	0.403** (0.010) [0.144]	0.404** (0.010) [0.144]
More than High School Education	-0.179** (0.016) [-0.057]	-0.179** (0.016) [-0.057]
Conduct Waiver	0.123** (0.015) [0.042]	N/A
Medical Waiver	0.035 (0.019) [0.012]	0.037* (0.019) [0.012]
Other Waiver	-0.109** (0.040) [-0.035]	-0.110** (0.040) [-0.035]
Drug Waiver	N/A	0.330** (0.027) [0.119]
Minor Traffic Waiver	N/A	0.203 (0.153) [0.072]
Serious Traffic Waiver	N/A	-0.029 (0.082) [-0.010]
Minor Non-Traffic Waiver	N/A	0.017 (0.065) [0.006]
Serious Non-Traffic Waiver	N/A	0.036 (0.021) [0.012]
Felony Waiver	N/A	0.044 (0.032) [0.015]

To easily compare the effect of explanatory variables on attrition and to see their change over time, the findings of the 180-day, 365-day, and the first term attrition models for the restricted sample are provided in Table 14. Conduct waivers have a decreasing effect on attrition in terms of the 180- and 365-day. This effect, however, is reversed for the first term attrition. It can be inferred that in the early times of the service, recruits with conduct waivers are less likely to attrite. On the other hand, before the end of the first term, they are more likely to attrite than recruits with no waivers. When the subcategories are analyzed, the serious traffic waivers have negative signs for all three

attrition points. This decreasing effect is significant for both 180- and 365-day attrition while it is not significant for the first term attrition. These waivers form 7.5% of all conduct waivers (Table 7) and the findings suggest that they have positive effects on attrition.

Minor non-traffic, serious non-traffic, and felony waivers form approximately 72% of all conduct waivers. Their signs are negative for 180-day and 365-day attrition, but, for the first term attrition, their signs become positive. It is not, however, significant even at the 5% level. This indicates that while recruits from these categories experience lower attrition in earlier times, they are experiencing higher attrition rates than recruits without waivers in the first-term.

Drug waiver category seems to be the driving force for the high attrition rates of recruits with conduct waivers. Drug waivers have a decreasing effect just on 180-day attrition, while they have an increasing effect on both 365-day and first term attrition. This partially explains the diminishing effect of having a conduct waiver on 365-day as well as reversal of sign seen in first term attrition.

Table 14. Comparative attrition table of same cohorts (Restricted sample)

	1st Model (Restricted)			2nd Model (Restricted)		
	180-day	365-day	First Term	180-day	365-day	First Term
Low AFQT	0.141** (0.011) [0.025]	0.125** (0.010) [0.027]	0.064** (0.008) [0.021]	0.141** (0.011) [0.025]	0.125** (0.010) [0.027]	0.064** (0.008) [0.021]
No High School Diploma	0.362** (0.012) [0.073]	0.372** (0.011) [0.089]	0.403** (0.010) [0.144]	0.362** (0.012) [0.073]	0.372** (0.011) [0.089]	0.404** (0.010) [0.144]
More than High School Education	-0.171** (0.021) [-0.027]	-0.154** (0.020) [-0.030]	-0.179** (0.016) [-0.057]	-0.171** (0.021) [-0.027]	-0.154** (0.020) [-0.030]	-0.179** (0.016) [-0.057]
Conduct Waiver	-0.103** (0.020) [-0.017]	-0.064** (0.018) [-0.013]	0.123** (0.015) [0.042]	N/A	N/A	N/A
Medical Waiver	0.095** (0.023) [0.017]	0.073** (0.021) [0.016]	0.035 (0.019) [0.012]	0.095** (0.023) [0.017]	0.074** (0.022) [0.016]	0.037* (0.019) [0.012]
Other Waiver	-0.090 (0.050) [-0.015]	-0.087 (0.047) [-0.017]	-0.109** (0.040) [-0.035]	-0.090 (0.050) [-0.015]	-0.087 (0.047) [-0.017]	-0.110** (0.040) [-0.035]
Drug Waiver	N/A	N/A	N/A	-0.050 (0.037) [-0.008]	0.032 (0.033) [0.007]	0.330** (0.027) [0.119]
Minor Traffic Waiver	N/A	N/A	N/A	0.270 (0.177) [0.055]	0.204 (0.171) [0.048]	0.203 (0.153) [0.072]
Serious Traffic Waiver	N/A	N/A	N/A	-0.304* (0.122) [-0.043]	-0.398** (0.120) [-0.066]	-0.029 (0.082) [-0.010]
Minor Non-Traffic Waiver	N/A	N/A	N/A	-0.163 (0.089) [-0.025]	-0.176* (0.082) [-0.034]	0.017 (0.065) [0.006]
Serious Non-Traffic Waiver	N/A	N/A	N/A	-0.105** (0.028) [-0.017]	-0.073** (0.026) [-0.015]	0.036 (0.021) [0.012]
Felony Waiver	N/A	N/A	N/A	-0.134** (0.043) [-0.021]	-0.119** (0.040) [-0.023]	0.044 (0.032) [0.015]

B. ALTERNATIVE GENERAL ATTRITION MODELS

As explained in the Data & Methodology section, to compare enlistees' attrition behavior and decide from which group to choose recruits to meet the recruiting goals, new dummy variables have been created. These variables allow combining the conduct waiver status, AFQT scores, and education. Also, with the help of these variables, the sample is divided into sub-groups. Table 3 details the numbers and percentages of each type of enlistee in the sample.

Again, probit regression models are used to determine the effect of the independent variables on the attrition. We looked at the 180-day, 365-day, and first term attrition of the enlistees in the sample. Besides the dummy variables combining the conduct waiver status, AFQT scores and education, demographics, enlistment waiver status, and participation in a youth program variables are included in the attrition models. For the purpose of capturing the significant cohort differences, dummy variables for the year cohorts are also included in the models. The authors develop three different models according to their base groups. In the first model the control group is defined as ideal recruits in order to compare their attrition behavior with the less than ideal recruits. In the second and the third models the base group has been changed to being an ideal recruit except having one bad trait: (No conduct waiver, high school or above, low AFQT) and (No conduct waiver, no high school, high AFQT). This allows us to determine whether there are significant differences when just adding one bad recruiting trait at a time.

1. First Model

In the first model, in all three attrition time points, the control group is the same and it includes recruits who join the Army without any type of conduct waiver, at least high school graduate and AFQT score higher than 50 (ideal group), and also the individual did not possess a medical or any other type of enlistment waiver. In addition, the base case is a white male recruit who is unmarried, with no dependents, and did not participate in a youth program or JROTC in all models. This study estimates the model coefficients only for the restricted sample to compare the same individuals' 180-day, 365-day, and first term attrition behavior. Table 15 presents the results for 180-day, 365-day, and first term attrition. The findings for the effect of all variables included in the alternative general attrition models are presented in Appendix G.

Table 15. Subgroups 180-day, 365-day and first term attrition results. Reference group: Ideal Recruits (No Waiver, High School Diploma or Above, High AFQT ≥ 50)

Restricted Sample	180-day Attrition	365-day Attrition	First Term Attrition
Medical Waiver	0.095** (0.023) [0.018]	0.073** (0.022) [0.016]	0.036 (0.019) [0.012]
Other Waiver	-0.085 (0.050) [-0.014]	-0.082 (0.047) [-0.017]	-0.102* (0.040) [-0.033]
No conduct waiver, high school or above, high AFQT(≥ 50)	Reference Group		
No conduct waiver, high school or above, low AFQT(<50)	0.177** (0.012) [0.032]	0.157** (0.011) [0.034]	0.087** (0.010) [0.029]
No conduct waiver, no high school , high AFQT(≥ 50)	0.432** (0.015) [0.092]	0.436** (0.015) [0.110]	0.470** (0.013) [0.171]
Conduct waiver , high school or above, high AFQT(≥ 50)	-0.096** (0.030) [-0.016]	-0.052* (0.026) [-0.011]	0.156** (0.021) [0.054]
No conduct waiver, no high school , low AFQT(<50)	0.461** (0.021) [0.102]	0.46** (0.020) [0.120]	0.448** (0.018) [0.164]
Conduct waiver , high school or above, low AFQT(<50)	0.119** (0.039) [0.022]	0.136** (0.036) [0.031]	0.281** (0.029) [0.101]
Conduct waiver , no high school , high AFQT(≥ 50)	0.270** (0.039) [0.055]	0.324** (0.036) [0.081]	0.446** (0.032) [0.165]
Conduct waiver , no high school , low AFQT(<50)	0.339** (0.076) [0.072]	0.300** (0.072) [0.074]	0.514** (0.061) [0.192]

Note: The bad recruiting traits are in bold.

For the 180-day attrition, the observed and the predicted probabilities of attrition are around 10%. This closely matches the findings in Chapter 3 and historically known attrition rates in the first 6 months. In accordance with these regression results, all the coefficients in the groups are significant at the 1% level. Table 16 illustrates the attrition

rates of groups compared to base group. Interestingly, the **“conduct waiver — high school graduate or above — high (≥ 50) AFQT”** group is the best group in terms of 180-day attrition. The partial effect of this group is -0.016. This indicates that individuals who belong to this group are 14.9% less likely to attrite than individuals who belong to the ideal group. The base group turns out to be the second best group. Table 18 also reflects the rankings of the groups based on their attrition rates. It can be seen that the worst groups in terms of 180-day attrition are recruits without conduct waivers and without a high school diploma regardless of AFQT scores. These categories form nearly 16% of all recruits and their attrition rates are nearly double the base group. These results are also consistent with the results of 365-day attrition.

In terms of first term attrition, the study’s base group turns out to be the best group. **“Conduct waiver — high school graduate or above — high (≥ 50) AFQT”** group is now the third best group after the **“No conduct waiver — high school or above — low (< 50) AFQT”** group. Even the attrition rates of recruits without conduct waivers and without high school diplomas improved a little, but it is still more than 50% compared to base group. Recruits with conduct waivers and without high school diplomas also yield similar results, but they only form 1.57% of all recruits in the sample. These findings suggest that high school diploma status is a very strong predictor of attrition. Having at least high school diploma more than compensates waiver status in terms of attrition. Thus, to decrease attrition rates, the Army should focus on recruits with high school diplomas — regardless of waiver status or AFQT scores. Instead of recruits without conduct waivers and without high school diplomas, enlisting more recruits with conduct waivers and with high school diploma will decrease the early attrition (180-365 day) greatly and decrease the first term attrition considerably, but not as much as early attrition.

Table 16. The attrition probabilities of groups compared to base group and the rankings

Subcategory	% of Sample	180-day Attrition	365-day Attrition	First Term Attrition
No conduct waiver, high school or above, high AFQT(≥ 50)	47.27%	BASE GROUP		
		2	2	1
No conduct waiver, high school or above, low AFQT (< 50)	28.75%	29.8%	24.4%	10.2%
		4	4	2
No conduct waiver, no high school , high AFQT(≥ 50)	10.93%	85.7%	78.9%	60.3%
		7	7	7
Conduct waiver , high school or above, high AFQT(≥ 50)	4.53%	-14.9%	-7.9%	19.1%
		1	1	3
No conduct waiver, no high school , low AFQT (< 50)	4.99%	95.1%	86.0%	57.9%
		8	8	5
Conduct waiver , high school or above, low AFQT (< 50)	1.96%	20.5%	22.2%	35.6%
		3	3	4
Conduct waiver , no high school , high AFQT(≥ 50)	1.17%	51.3%	58.1%	58.2%
		5	6	6
Conduct waiver , no high school , low AFQT (< 50)	0.40%	67.1%	53.1%	67.7%
		6	5	8

When we compare the attrition rates of recruits having only one bad trait, we see that recruits having only conduct waiver as a bad trait have lower attrition rates on 180-, and 365-days. In the first term attrition model, recruits having only low AFQT score as a bad trait have lower attrition rates than recruits only having a conduct waiver, or no high school diploma as a bad trait. Non-high school graduates are the worst group among the recruits with only one bad trait.

When we compare recruits with two bad traits, we see that recruits having both conduct waivers and low AFQT scores as bad traits have the lowest attrition rates than the other recruits with two bad traits. Recruits having conduct waivers and without high school diploma as bad traits have better attrition results in 180-, and 365-days than recruits having high school diploma and low AFQT scores as bad traits. In the first term their attrition rates are very close to each other.

2. Second Model

In the second model, the control group is the set of recruits who join the Army without any type of conduct waiver, without a high school diploma and a high AFQT score (**“no conduct waiver — no high school — high AFQT”**). Table 17 presents the results for 180-day, 365-day, and first term attrition. In accordance with these regression results, all the coefficients in the groups except **“no conduct waiver — no high school — low AFQT”** and **“conduct waiver — no high school — low AFQT”** are significant at the 1% level. The findings for the effects of all variables included in the models are presented in Appendix H. The two coefficients we focus on are those where we change one recruit characteristics to a less-than favorable one. The two are **“no conduct waiver — no high school — low AFQT”**, and **“conduct waiver — no high school — high AFQT”**.

The partial effect of **“no conduct waiver — no high school — low AFQT”** group is 0.005 for the 180-day attrition, 0.005 for the 365-day attrition, and -0.007 for the first term attrition. Interestingly it is found that when the AFQT score status turns from high to low for the **“no conduct waiver — no high school”** group; it has an increasing effect on 180-day and 365-day attrition, and it has a decreasing effect on first term attrition but these results are not significant at 5% level.

The partial effect of **“conduct waiver — no high school — high AFQT”** group is -0.025 for the 180-day, -0.022 for the 365-day, and -0.008 for the first term attrition and they are significant at the 1% level. This indicates that individuals who belong to this group are 23.3% less likely to attrite for the 180-day, 15.8% less likely to attrite for the 365-day attrition, and 2.8% less likely to attrite for the first term attrition than individuals

who belong to control group. This effect is significant at the 1% level for the 180-day and 365-day attrition but it becomes insignificant for the first-term attrition. When the conduct waiver status changed from “no conduct” to “conduct” for the **“no high school — high AFQT”** group; it has a decreasing effect on 180-day, 365-day, as well as first term attrition. This indicates that being in the group (conduct waiver and non high school graduate) decreases the attrition. Since both categories are considered less than ideal, this finding seems to be contrary to the findings in the general attrition models. This is mostly depending on conduct waiver status. In the general attrition models, for 180-day and 365-day attrition it is found that recruits with conduct waivers have a significantly lower probability of attrition compared to recruits without conduct waivers but after 1-year point the effect of conduct waiver turns out to be negative.

We see that the effect of not having a high school diploma depends on the conduct waiver status and AFQT category. Interacting the conduct waiver variable with the no high school and the high AFQT produce a counter-intuitive negative coefficient across all three measures of attrition, thus indicating that having a conduct waiver for the “no high school — high AFQT” group is associated with a lower probability of attrition. This is likely not causal, as there are probably other factors that we are not capturing in the model, such as AFQT differences not captured by our simple low-high classification.

Table 17. Subgroups 180-day, 365-day and first term attrition results. Reference Group: No Waiver, No High School Diploma, High AFQT ≥ 50)

Restricted Sample	180-day Attrition	365-day Attrition	First Term Attrition
Medical Waiver	0.095** (0.023) [0.018]	0.073** (0.022) [0.016]	0.036 (0.019) [0.012]
Other Waiver	-0.085 (0.050) [-0.014]	-0.082 (0.047) [-0.017]	-0.102* (0.040) [-0.033]
No conduct waiver, high school or above, high AFQT(≥ 50)	-0.432** (0.015) [-0.074]	-0.436** (0.015) [-0.091]	-0.470** (0.013) [-0.155]
No conduct waiver, high school or above, low AFQT(<50)	-0.255** (0.017) [-0.041]	-0.278** (0.016) [-0.055]	-0.383** (0.014) [-0.122]
Conduct waiver, high school or above, high AFQT(≥ 50)	-0.527** (0.031) [-0.066]	-0.488** (0.028) [-0.079]	-0.314** (0.023) [-0.095]
No conduct waiver, no high school , high AFQT(≥ 50)	REFERENCE GROUP		
No conduct waiver, no high school, low AFQT(<50)	0.029 (0.024) [0.005]	0.024 (0.022) [0.005]	-0.022 (0.020) [-0.007]
Conduct waiver, no high school, high AFQT(≥ 50)	-0.162** (0.041) [-0.025]	-0.112** (0.038) [-0.022]	-0.024 (0.033) [-0.008]
Conduct waiver, high school or above, low AFQT(<50)	-0.312** (0.041) [-0.044]	-0.299** (0.038) [-0.053]	-0.189** (0.031) [-0.060]
Conduct waiver, no high school, low AFQT(<50)	-0.092 (0.076) [-0.015]	-0.136 (0.073) [-0.026]	0.044 (0.062) [0.015]

3. Third Model

In the third model, the control group is the recruits who join the Army without any type of conduct waiver, with high school diploma or above and AFQT score lower than 50 (“no conduct waiver — high school or above — low AFQT”). Table 18

presents the results for 180-day, 365-day, and first term attrition. The findings for the effect of all variables included in the models are presented in Appendix I. The two coefficients we focus on are those where we change one recruit characteristics to a less-than favorable one. The two are **“no conduct waiver — no high school — low AFQT”**, and **“conduct waiver — high school or above — low AFQT”**.

The partial effect of **“no conduct waiver — no high school — low AFQT”** group is 0.058 for the 180-day attrition, 0.074 for the 365-day attrition, and 0.131 for the first term attrition. They are significant at 1% level. This indicates that when the education status changed from “high school or above” to “no high school” for the **“no conduct waiver — low AFQT”** group; it has an increasing effect on all three attrition points; individuals who belong to this group are 54% more likely to attrite by 180 days, 53% more likely to attrite by 365 days, and 46% more likely to attrite within the first term than individuals who belong to control group. In the general attrition models for the restricted sample it was found that no high school diploma has an increasing effect on attrition (68.1% for the 180-day, 63.8% for the 365-day, and 50.8% for the first term attrition). This indicates that the effect of being non-high school graduate is diminishing for the **“no conduct waiver — low AFQT”** group.

The partial effect of **“conduct waiver — high school or above — low AFQT”** group is -0.010 for the 180-day, -0.004 for the 365-day, and 0.068 for the first term attrition. This indicates that individuals who belong to this group are 9.2% less likely to attrite for the 180-day, 2.9% less likely to attrite for the 365-day attrition, and 24% more likely to attrite for the first term attrition than individuals who belong to control group. This effect is not significant for the 180-day and 365-day attrition but it is significant for the first-term attrition at the 1% level. When the conduct waiver status changed from “no waiver” to “waiver” for the **“high school or above — low AFQT”** group; it has a decreasing effect on 180-day and 365-day attrition but it has an increasing effect on first term attrition. In the general attrition models, it is found that recruits with conduct waivers are 15.8% less likely to attrite for the 180-day, 9.3 % less likely to attrite for the

365-day, and 14.8% more likely to attrite for the first term attrition than recruits without conduct waivers. This indicates that the effect of conduct waiver on attrition is more robust and negative for the “**high school or above — low AFQT**” group.

We see that the effect of low AFQT scores depends on the conduct waiver status and the education level. In the sample of recruits with low AFQT scores, recruits without a high school diploma yield the worst attrition results. When we hold high-school graduate and low AFQT variables constant, we see that recruits with conduct waivers have better results for 180 and 365 days while recruits without waivers have better first term attrition results. So, in the sample of recruits with low AFQT scores, priority should be given to the recruits without waivers and with high school diploma in order to reduce first term attrition. After recruiting from this group priority should be given to the recruits with a waiver and with a high school diploma in order to reduce the attrition in all three attrition points because they have lower attrition rates than the recruits without waivers and without a high school diploma.

Table 18. Subgroups 180-day, 365-day and first term attrition results. Reference Group: No Waiver, High School Diploma or Above, Low AFQT < 50)

Restricted Sample	180-day Attrition	365-day Attrition	First Term Attrition
Medical Waiver	0.095** (0.023) [0.018]	0.073** (0.022) [0.016]	0.036 (0.019) [0.012]
Other Waiver	-0.085 (0.050) [-0.014]	-0.082 (0.047) [-0.017]	-0.102* (0.040) [-0.033]
No conduct waiver, high school or above, high AFQT(>=50)	-0.177** (0.012) [-0.030]	-0.157** (0.011) [-0.033]	-0.087** (0.010) [-0.029]
No conduct waiver, no high school, high AFQT(>=50)	0.255** (0.017) [0.050]	0.278** (0.016) [0.066]	0.383** (0.014) [0.138]
No conduct waiver, high school or above, low AFQT(<50)	REFERENCE GROUP		
Conduct waiver, high school or above, high AFQT(>=50)	-0.272** (0.030) [-0.040]	-0.210** (0.027) [-0.040]	0.069** (0.021) [0.023]

No conduct waiver, no high school, low AFQT(<50)	0.284** (0.022) [0.058]	0.302** (0.020) [0.074]	0.361** (0.018) [0.131]
Conduct waiver, high school or above, low AFQT(<50)	-0.058 (0.039) [-0.010]	-0.021 (0.036) [-0.004]	0.194** (0.030) [0.068]
Conduct waiver, no high school, high AFQT(>=50)	0.093* (0.040) [0.017]	0.167** (0.037) [0.038]	0.359** (0.032) [0.130]
Conduct waiver, no high school, low AFQT(<50)	0.163* (0.076) [0.031]	0.143* (0.072) [0.033]	0.427** (0.062) [0.157]

C. UNSUITABILITY ATTRITION MODELS

Unsuitability attrition is different from general attrition in that it incorporates the reasons why individuals separate. For the purpose of examining unsuitability attrition behavior of recruits in the sample, this study defines 4 categories of unsuitability attrition. These are: unsuitability attrition, behavior-related attrition (broad), behavior-related attrition (narrow), and substance abuse attrition. Table 19 details the categories of attrition and their numbers and percentages in the sample. Unsuitability attrition is the broadest category. The unsuitability attrition category classifications are created according to the separation reasons which are presented in Appendix A. In terms of unsuitability attrition, we include all attrition categories related with character or behavior disorder, commission of a serious offence, unsatisfactory performance, unsuitability to the service, fraudulent entry, failure to meet minimum qualifications for retention, civil court conviction, court martial, dropped from strength because of imprisonment or desertion, homosexuality, sexual perversion, drug usage, or alcoholism. After that, we define two kinds of behavior-related attrition — narrow and broad. For the broad behavior-related attrition, we include attritions due to character or behavior disorder, commission of a serious offence, civil court conviction, court martial, dropped from strength because of imprisonment or desertion, drug usage, or alcoholism. For the narrow behavior-related attrition, we include all the attrition reasons that fall into the broad category except drug- and alcoholism-related attritions. For the purpose of investigating drug and alcoholism related attritions, we solely define the substance abuse attrition.

Unsuitability attrition constitutes a huge proportion of the attrition and these attritions are mostly dependent on the individuals' behavior and performance (mostly they are not suitable for the service and do not fit into the Army). Further, unsuitability attritions have a negative effect on the individuals who complete their duties and careers successfully. Investigating the contributing factors to unsuitability attrition and finding solutions to decrease these kinds of attritions becomes very important for the services.

Table 19. Details of attrition categories

Category	Unrestricted Sample (2000-2005)		Restricted Sample (2000-2002)	
	Observations	% of Total Attrition	Observations	% of Total Attrition
Total Separation	129,433	N/A	81,326	
Total Attrition	77,190	100.00 %	41,935	100.00 %
Unsuitability Attrition	29,366	38.04 %	15,630	37.27%
Behavior Related Attrition (Broad)	26,538	34.38 %	13,911	33.17 %
Behavior Related Attrition (Narrow)	20,967	27.16 %	11,383	27.14 %
Substance Attrition	5,616	7.27 %	2,528	6.03 %

In this part, we investigate contributing factors to the unsuitability attrition. We believe that with the help of the findings on the unsuitability attrition, the Army can reduce its unsuitability attrition rates. We use probit models and estimates multivariate models of unsuitability attritions as a function of all observed variables and the conduct waiver categories. Table 20 presents the findings for the effect of conduct waivers on unsuitability, behavior-related, and substance abuse-related attritions. The findings for the effect of all variables included in the models are presented in Appendix J.

Table 20. The effect of conduct waivers on unsuitability, behavior related and substance abuse related attritions

	Unsuitability Attrition	Behavior Related Attrition (Broad)	Behavior Related Attrition (Narrow)	Substance Abuse Attrition
Low AFQT	0.136** (0.011) [0.037]	0.139** (0.011) [0.034]	0.144** (0.012) [0.031]	0.043* (0.009) [0.003]
No high School Diploma	0.417** (0.013) [0.123]	0.428** (0.013) [0.117]	0.411** (0.013) [0.100]	0.224** (0.021) [0.016]
More than High School Education	-0.005 (0.024) [-0.001]	0.017 (0.025) [0.004]	0.022 (0.026) [0.005]	-0.013 (0.042) [-0.001]
Medical Waiver	-0.101** (0.026) [-0.025]	-0.094** (0.027) [-0.022]	-0.107** (0.028) [-0.021]	-0.002 (0.044) [-0.000]
Other Waiver	0.098 (0.059) [0.027]	0.122 (0.061) [0.031]	0.143* (0.063) [0.033]	-0.039 (0.116) [-0.002]
Drug Waiver	0.537** (0.031) [0.172]	0.562** (0.032) [0.171]	0.331** (0.034) [0.083]	0.695** (0.040) [0.079]
Minor Traffic Waiver	0.062 (0.206) [0.017]	0.059 (0.211) [0.015]	0.037 (0.221) [0.008]	0.108 (0.328) [0.007]
Serious Traffic Waiver	0.331** (0.101) [0.100]	0.368** (0.102) [0.105]	0.291** (0.109) [0.072]	0.351* (0.148) [0.030]
Minor Non-Traffic Waiver	0.246** (0.077) [0.072]	0.270** (0.078) [0.074]	0.255** (0.081) [0.062]	0.146 (0.126) [0.010]
Serious Non- Traffic Waiver	0.215** (0.026) [0.062]	0.239** (0.027) [0.064]	0.156** (0.029) [0.036]	0.319** (0.039) [0.026]
Felony Waiver	0.243** (0.040) [0.071]	0.271** (0.040) [0.074]	0.136** (0.043) [0.031]	0.438** (0.055) [0.040]

The results in the table indicate that all the conduct waiver sub-categories carry a positive sign, significant at the 1% level — except for Minor Traffic Waivers. This suggests that, because of behavioral problems, recruits with conduct waivers are more likely to attrite than the control group. The minor traffic waiver category, however, contains only 72 observations. This could be the reason why the predicted effect appears insignificant. Based on the findings, when the unsuitability attrition is considered as a quality of measure, the drug waiver category is the worst group among the conduct waiver categories. If the base recruit in the sample has a probability of unsuitability

attrition of 19.2% based on their observable characteristics without a conduct waiver, an identical recruit with a drug waiver would have a predicted probability of unsuitability attrition of 36.4%. The 17.2 percentage point increase in probability represents an 89.5% increase added by having a drug waiver. Table 21 reflects the percentage change of attrition and the rankings of the conduct waiver categories based on their attrition rates. Recruits who enlisted with a drug waiver are 89.5% more likely to attrite for the unsuitability attrition; 100% more likely to attrite for broad-behavior related attrition; 59.3% more likely to attrite for the narrow-behavior related attrition; and 254% more likely to attrite for the substance-related attrition than individuals with no conduct waivers. Minor-traffic subgroup seems to be the best conduct waiver category, but the findings are not significant and the group only consists of 72 observations. After minor-traffic group, serious non-traffic group is the best group among conduct waiver categories for the unsuitability attrition and broad-behavior related attrition. Recruits that enlisted with serious non-traffic waivers are 32.3% more likely to attrite for the unsuitability attrition; 37.4% more likely to attrite for broad-behavior related attrition; 25.7% more likely to attrite for the narrow-behavior related attrition; and 83.6% more likely to attrite for the substance-related attrition than individuals with no conduct waivers.

In the general attrition models, it can be seen that having a drug waiver has the biggest effect on attrition among the other conduct waivers. Also in the unsuitability attrition model, it can be seen that having a drug waiver increases the probability of unsuitability attrition more than other conduct waivers. This is not due only to substance use because, even when analyzing the narrow behavioral attrition category which does not include substance abuse attrition, having a drug waiver is again the worst category. When the other sub-categories of conduct waivers are analyzed, it can be seen that having any type of conduct waiver increases the probability of unsuitability attrition. Interestingly, the recruits with serious traffic, serious non-traffic, and felony waivers are also more likely to attrite because of substance abuse reasons than behavioral problems.

Table 21. The rankings of the conduct waiver categories based on their attrition rates (1=The Best Group, 6= The Worst Group)

Type of Waiver	% of Sample	% of Conduct Waivers	Unsuitability Attrition	Behavior Related Attrition (Broad)	Behavior Related Attrition (Narrow)	Substance Abuse Attrition
Drug Waiver	1.48%	18.38%	89.5% 6	99.9% 6	59.3% 6	254% 6
Minor Traffic Waiver	0.03%	0.35%	8.8% 1	8.8% 1	5.7% 1	22.5% 1
Serious Traffic Waiver	0.60%	7.46%	52% 5	61.4% 5	51.5% 5	96.5% 4
Minor Non-Traffic Waiver	0.26%	3.18%	37.5% 4	43.3% 4	44.3% 4	32.2% 2
Serious Non-Traffic Waiver	4.06%	50.48%	32.3% 2	37.4% 2	25.7% 3	83.6% 3
Felony Waiver	1.44%	17.87%	36.9% 3	43.3% 3	22.2% 2	128.6% 5

Educational credentials and AFQT scores are good predictors of unsuitability attrition. The results in the table indicate that the Non-High School Graduate and the low AFQT variables have a significant positive sign (significant at 1%). The findings suggest that Non-High School Graduates are 64% more likely to attrite for the unsuitability attrition, 68.4% more likely to attrite for the broad-behavior related attrition, 71.5% more likely to attrite for the narrow behavior related attrition, and 51.4% more likely to attrite for the substance related attrition than High School graduates. Another finding is that recruits enlisted with low AFQT scores are 19.3% more likely to attrite for the unsuitability attrition, 19.9% more likely to attrite for the broad-behavior related attrition, 22.2% more likely to attrite for the narrow-behavior related attrition, and 9.6% more likely to attrite for the substance related attrition than recruits with high AFQT scores. It can be concluded that having no high school diploma has more increasing effect on unsuitability attrition categories than the low AFQT scores.

When the other variables are analyzed, it can be seen that having a medical waiver reduces unsuitability attrition by 13%, reduces broad behavior related attrition by 12.9%, reduces narrow behavior related attrition by 12.9%, reduces substance abuse attrition by 1%. This is significant at the 1% level for all unsuitability attrition categories except substance abuse attrition. Earlier in general attrition models, it was found that having a medical waiver has an increasing effect on the attrition. Now, however, it is found that they have a decreasing effect on the unsuitability attrition. This suggests that they do not usually attrite because of unsuitability reasons, but perhaps for reasons related to their physical condition.

D. ALTERNATIVE UNSUITABILITY ATTRITION MODELS

Again, probit regression models are used to determine the effect of the independent variables on the unsuitability attrition. We look at the unsuitability, behavior-related and substance abuse-related attritions of the enlistees in the sample. As well as the dummy variables combining the conduct waiver status, AFQT scores, and education variables, the variables for demographics, enlistment waiver status, and participation in a youth program are also included in the attrition models. For the purpose of capturing the significant cohort differences, dummy variables for the year cohorts are also included in the models. In all four attrition models, the control group is the same and it includes recruits who join the Army without any type of conduct waiver, high school graduate, and AFQT score higher than 50 (ideal group). Also the individuals do not possess medical or any other type of enlistment waivers. In addition, the base case in all models is a white male recruit who is unmarried, with no dependents, and who did not participate in a youth program or JROTC. Table 22 presents the results for unsuitability, behavior-related and substance abuse-related attrition. The findings for the effect of all variables included in the models are presented in Appendix K.

Table 22. Subgroups' unsuitability, behavior related, and substance abuse related attrition results

	Unsuitability Attrition	Behavior Related Attrition (Broad)	Behavior Related Attrition (Narrow)	Substance Abuse Attrition
Medical Waiver	-0.102** (0.026) [-0.026]	-0.095** (0.027) [-0.022]	-0.107** (0.028) [-0.021]	-0.005 (0.044) [-0.000]
Other Waiver	0.101 (0.059) [0.028]	0.124* (0.061) [0.032]	0.144* (0.063) [0.033]	-0.032 (0.115) [-0.002]
No conduct waiver, high school or above, high AFQT(>=50)	REFERENCE GROUP			
No conduct waiver, high school or above, low AFQT(<50)	0.161** (0.013) [0.044]	0.168** (0.013) [0.042]	0.174** (0.014) [0.038]	0.059* (0.023) [0.004]
No conduct waiver, no high school, high AFQT(>=50)	0.478** (0.016) [0.146]	0.492** (0.016) [0.141]	0.464** (0.017) [0.118]	0.296** (0.027) [0.023]
Conduct waiver, high school or above, high AFQT(>=50)	0.371** (0.026) [0.113]	0.408** (0.026) [0.117]	0.255** (0.029) [0.061]	0.546** (0.037) [0.054]
No conduct waiver, no high school, low AFQT(<50)	0.509** (0.022) [0.160]	0.521** (0.023) [0.154]	0.510** (0.024) [0.136]	0.244** (0.039) [0.019]
Conduct waiver, high school or above, low AFQT(<50)	0.560** (0.035) [0.181]	0.582** (0.036) [0.178]	0.417** (0.038) [0.108]	0.630** (0.049) [0.068]
Conduct waiver, no high school, high AFQT(>=50)	0.672** (0.038) [0.223]	0.707** (0.038) [0.225]	0.607** (0.040) [0.170]	0.561** (0.056) [0.058]
Conduct waiver, no high school, low AFQT(<50)	0.699** (0.072) [0.235]	0.726** (0.073) [0.233]	0.574** (0.077) [0.160]	0.671** (0.099) [0.076]

According to these regression results, all the coefficients on the subgroups are significant at the 1% level. As expected, the reference group (**no conduct waiver — high school or above — high AFQT**) is the best group when the unsuitability attrition is a quality of measure. The “**No conduct waiver — high school or above — low AFQT**”

group is the second best group. The partial effect of this group is 0.044 for the unsuitability attrition; 0.042 for the broad behavior related attrition; 0.038 for the narrow behavior-related attrition; and 0.004 for the substance abuse attrition. This would indicate that individuals who belong to this group are 22.9% more likely to attrite for the unsuitability attrition; 24.6% more likely to attrite for the broad behavior-related attrition; 27.2% more likely to attrite for the narrow behavior-related attrition; and 12.9% more likely to attrite for the substance-related attrition than individuals who belong to ideal group. Interestingly, after the **ideal group** and **“No conduct waiver — high school or above — low AFQT”** group, **“Conduct waiver — high school or above — high AFQT”** is the third best group except substance abuse-related attrition. For the substance related attrition, they are the 5th best group. This would indicate that individuals who belong to this group are 58.8% more likely to attrite for the unsuitability attrition; 68.4% more likely to attrite for the broad behavior-related attrition; 43.6% more likely to attrite for the narrow behavior-related attrition; and 174.2% more likely to attrite for the substance-related attrition than individuals who belong to ideal group. Table 23 reflects the rankings of the groups based on their attrition rates. This suggests that instead of enlisting no waiver and no high school graduates (**no conduct waiver — no high school — high AFQT, No conduct waiver — no high school — low AFQT**; note that these 2 groups from around 16% of the sample), Army should enlist conduct waivers who are high school graduates and whose AFQT scores are higher than 50. This would decrease its unsuitability and behavior related attrition rates.

Table 23. The percentage differences of attrition rates compared to Base Group and the rankings of the conduct waiver categories based on their attrition rates

(1=The Best Group, 6= The Worst Group)

Sub Groups	% of Sample	Unsuitability Attrition	Behavior-Related Attrition (Broad)	Behavior-Related Attrition (Narrow)	Substance Abuse Attrition
No conduct waiver, high school or above, high AFQT(≥ 50)	47.27%	BASE GROUP			
		1	1	1	1
No conduct waiver, high school or above, low AFQT (< 50)	28.75%	22.9% 2	24.6% 2	27.2% 2	12.9% 2
No conduct waiver, no high school , high AFQT(≥ 50)	10.93%	76.0% 4	82.5% 4	84.4% 5	74.2% 4
Conduct waiver , high school or above, high AFQT(≥ 50)	4.53%	58.8% 3	68.4% 3	43.6% 3	174.2% 5
No conduct waiver, no high school , low AFQT (< 50)	4.99%	83.3% 5	90.1% 5	97.2% 6	61.3% 3
Conduct waiver , high school or above, low AFQT (< 50)	1.96%	94.2% 6	104.1% 6	77.2% 4	219.4% 7
Conduct waiver , no high school , high AFQT(≥ 50)	1.17%	116.1% 7	131.6% 7	121.5% 8	187.1% 6
Conduct waiver , no high school , low AFQT (< 50)	0.40%	122.3% 8	136.3% 8	114.4% 7	245.2% 8

When we compare the unsuitability attrition rates of recruits having only one bad trait, we see that recruits having only a low AFQT score as a bad trait have the lowest attrition rates on all unsuitability attrition models. Recruits having only a conduct waiver as a bad trait have lower unsuitability attrition rates than recruits having only no high-school as a bad trait for all unsuitability attrition categories except substance abuse

attrition. For the substance abuse attrition, recruits having only conduct waivers as a bad trait are the worst group. So, generally, those with conduct waivers should be preferred over those without a high school diploma, but they should not be preferred over those with a low AFQT score.

When we compare recruits with two bad traits, we see that recruits having both no high school diploma and low AFQT scores as bad traits have lower unsuitability attrition rates in all categories except behavior-related attrition (narrow). Recruits having both conduct waivers and low AFQT scores as bad traits are better in terms of behavior related attrition (narrow) but they have the worst results in substance abuse attrition. Recruits having both conduct waivers and no high-school diploma as bad traits are worst group in all unsuitability attrition categories except the substance abuse attrition.

We can see that the effect of not having a high school diploma on unsuitability attrition is bigger than having a conduct waiver except for substance abuse attrition. Not having a high school diploma and having a conduct waiver has larger detrimental effects on unsuitability attrition than low AFQT scores. So when they come together they form the worst categories in terms of unsuitability attrition.

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V. CONCLUSIONS AND RECOMMENDATIONS

A. SUMMARY OF FINDINGS AND CONCLUSIONS

In the general attrition models, this study finds consistent results with the historical studies in terms of educational credentials. The effect of having a high school diploma or more has large and significant effect throughout the first term in both restricted and unrestricted sample. Restricted sample results are reported to make comparisons on the same cohort in all time points. The effect of having a high school diploma or more education on the 180-day attrition is around 60%; 59% for 365-day; and 50% for the first term. It can be seen that not having a high school diploma has more effect on early attrition. AFQT score also has a decreasing and significant effect on attrition throughout the first term. Recruits enlisted with low AFQT scores are 23.3% more likely to attrite for the 180-day attrition; 19.3% more likely to attrite for the 365-day attrition; and 7.4% more likely to attrite for the first-term attrition than recruits with high AFQT scores.

Recruits with a medical waiver are more likely to attrite throughout the first term. The magnitude of this effect diminishes over time. Having a medical waiver increases attrition by 15.8%, 11.5%, and 4.6% in the 180-, 365-day, and first term, respectively, although they tend to have more education and higher AFQT scores, so that medical waivers are not necessarily bad. In terms of other waivers, we find consistent results over time. This suggests that recruits with other waivers are approximately 13% less likely to attrite from recruits with no waivers in the restricted sample. Since these recruits also hold more education, their attrition rates are likely to decrease more with the effect of educational credentials.

When attrition results of recruits with conduct waivers are analyzed, it can be seen that these recruits are less likely to attrite in the early times. This is on par with the findings of Putka and Strickland (2005) in FY03 cohort's BCT attrition rates and Distifeno's (2008) 180-, 365-day attrition models. This study finds that recruits with conduct waivers are 15.8% and 9.3% less likely to attrite in 180- and 365-day,

respectively. The effect also diminishes over time. Eventually, when we look at the first term attrition model, it can be seen that recruits with conduct waivers are 14.8% more likely to attrite than recruits without waivers in the restricted sample. It is difficult to interpret why this is happening, but since the outside job opportunities of recruits with criminal history or drug problems are limited, they might be more motivated towards being in the military in the early times. Recruits are also observed heavily in the basic training and specialty training which takes place within the first year. Thus, when the intensity of control decreases, past behaviors of recruits with conduct waivers can more likely affect their present behaviors and decisions.

Since conduct waivers are given for various kinds of offenses and drug affiliations, we wanted to see if there were differences among the sub-categories of conduct waivers. We find that serious traffic waivers, which are 7.5% of all waivers, have a decreasing effect on attrition for all time points. Minor non-traffic, serious non-traffic, and felony waivers, which are 72% of all waivers, have a decreasing effect on early attrition. When we look at the first term attrition, it can be seen that these waivers yield positive signs. This means an increasing effect on attrition. They are, however, not significant at the 5% level and their magnitude is much smaller than the effect of all conduct waivers on first term attrition. Drug waiver category (18.38% of all conduct waivers) yields the worst results within the conduct waiver categories. The decreasing effect on the 180-day attrition immediately turns into an increasing effect on the 365-day, but this result is not significant at the 5% level. Also drug waivers have substantial differences in magnitude in both the 180- and 365-day attrition from other waiver categories. This difference is more evident in the first term attrition where recruits with drug waivers are 42% more likely to attrite from the recruits with no waivers. With these results, drug waiver category obviously sticks out from other conduct waiver categories since the results of other conduct waivers are almost similar to each other.

Within the entire less-than ideal qualifications (educational credentials and waivers) that this study analyzed, it is seen that lower educational credentials have more effect on attrition than the waivers. The decreasing effect of medical and conduct waivers

on attrition can easily be offset by requiring higher educational credentials. This has already been implemented by the Army officials in the perspective of “whole person” policy.

In an effort to see the interactions of educational credentials and conduct waivers on attrition, we created another attrition model in which the whole sample of recruits was divided into 8 groups according to their education level, AFQT score, and conduct waiver status. Medical and other waiver variables are also included in the model. In this alternative model, it was found that recruits with conduct waivers, with a high school diploma and high AFQT, are the best group in 180- and 365-day attrition. They are 14.9% and 7.9% less likely to attrite in the 180- and 365-day, respectively, from the base case (high school diploma, AFQT ≥ 50 , without conduct waiver). Worst categories in 180- and 365-day attrition happen to be the recruits “without a high school diploma and without waivers, regardless of the AFQT scores” in which they are more than 80% more likely to attrite from the base case. When we looked at the first term attrition results, it was seen that the base case is the best group. Recruits with conduct waivers, high school diploma, and AFQT ≥ 50 are now 19% more likely to attrite from the base case. The worst group is the recruits without a high school diploma, AFQT < 50 , and with conduct waivers which form only 0.40% of all recruits. They are 67% more likely to attrite from the base case.

Changing the reference group in the alternative general attrition models allows us to further investigate the effect of interactions of educational credentials and conduct waivers on attrition. We found that the effect of having a conduct waiver on attrition depends on the education status and the AFQT category of the recruit. The effect of having a conduct waiver on attrition is more robust and negative (increasing attrition) for the **“high school or above — low AFQT”** group than **“high school or above — high AFQT”** group. On the other hand, having a conduct waiver has more decreasing effect on attrition for the **“no high school — high AFQT”** group than **“high school or above — high AFQT”** group.

We believe that combining the results of attrition with unsuitability attrition may give more robust and supportable results. Thus, when the effect of less than ideal qualifications on unsuitability attrition was analyzed, it was seen that not having a high school diploma and having a low AFQT score have a considerable increasing effect on unsuitability attrition. Also, having no high school diploma has more increasing effect on unsuitability attrition categories than having low AFQT scores. Medical waivers have a decreasing effect while other waivers have an increasing effect on unsuitability attrition based on a recruit without waivers in FY2000 through FY2002.

All of the conduct waiver categories have an increasing effect on unsuitability attrition. Again it is seen that drug waivers have the largest effect within the conduct waiver categories. This suggests that recruits with drug waivers are 88% more likely to attrite because of unsuitability attrition than the recruits without waivers. When behavior-related attrition and substance abuse attrition are analyzed separately, it is seen that recruits with drug waivers are 254% more likely to attrite because of substance abuse related attrition. They are, however, 57% more likely to attrite because of behavior-related (narrow) attrition than recruits with no waivers. These results suggest that recruits with drug waivers are more likely to re-offend because of the same reasons which they are granted waivers. The other conduct waiver categories have also considerable increasing effect on unsuitability attrition. The results, however, are a little surprising: we expected a cause-effect relationship as this study captured in drug waivers — substance abuse attrition relationship. The probability of substance abuse attrition is larger than behavior-related (narrow) attrition in all categories of conduct waivers — except minor non-traffic category.

In the alternative unsuitability attrition model, we look at the unsuitability attrition rates of the 8 sub-groups (as defined in the general attrition model). After the base group, which includes recruits with a high school diploma, without conduct waivers, and with high AFQT scores, the second best group is the recruits with a high school diploma, without conduct waivers, and with low AFQT scores. Recruits with conduct waivers, with a high school diploma, and with high AFQT scores are better in terms of unsuitability attrition from the groups without high school diploma, and without conduct

waivers — regardless of the AFQT scores. The worst groups are recruits without high school diploma and with conduct waivers — regardless of the AFQT scores. In terms of behavioral attrition (narrow), recruits with conduct waivers and high school diploma are better than recruits without conduct waivers and without high school diploma. The substance attrition results groups, including conduct waivers, are much worse than groups not including conduct waivers — regardless of the education status and AFQT scores.

As a result, this study concludes that educational credentials are not only strong predictors for attrition, but also for unsuitability attrition. Having a high school diploma or above and having a high AFQT score has a decreasing effect on attrition. When they interact with waivers, they have mitigating effects. Medical waivers have an increasing effect on attrition, but they do not usually attrite for unsuitability reasons since they have a decreasing effect on unsuitability attrition. Also, the increasing effect of medical waivers is believed to be offset by the higher educational credentials.

Conduct waivers have a decreasing effect on early attrition, but this effect turns to an increasing effect at the end of first term. In terms of unsuitability attrition, however, it is seen that conduct waivers increases the probability of unsuitability attrition significantly. This effect increases with the diminishing educational standards. When subcategories of conduct waivers are analyzed, drug waivers happen to be the worst conduct waiver category in terms of both attrition and unsuitability attrition. When interactions of conduct waivers and educational credentials are analyzed, the worst group is the recruits with conduct waivers, without a high school diploma, and with low AFQT scores in both attrition and unsuitability attrition.

B. RECOMMENDATIONS

In the general attrition models when we compared the attrition rates of recruits having only one bad trait, we see that recruits having only conduct waiver as a bad trait have lower attrition rates for 180-, and 365-days but higher attrition rates by the end of the first term. In the first term attrition model, recruits having only a low AFQT score as a bad trait have lower attrition rates than recruits only having a conduct waiver or no high school diploma as a bad trait. No high school graduates are the worst group among the

recruits with only one bad trait. Based on these findings, after an ideal recruit, the Army should enlist recruits from the low AFQT group (**“No conduct waiver –high school — low AFQT”**) because the evidence suggests they will be less likely to attrite. When we compare recruits with two bad traits, we see that recruits having both conduct waivers and low AFQT scores as bad traits have the lowest attrition rates among the other recruits with two bad traits. Recruits having conduct waivers and without high school diploma as bad traits have better attrition results in 180-, and 365-days than recruits having high school diploma and low AFQT scores as bad traits. In the first term their attrition rates are very close to each other. After enlisting low-AFQT people, the Army should then take those with conduct waivers rather than those without a high school diploma..

After comparing the unsuitability attrition rates of recruits having only one bad trait, we see that recruits having only low AFQT score as a bad trait have lower attrition rates on all unsuitability attrition models. Recruits having only conduct waivers as a bad trait have lower unsuitability attrition rates than recruits having only no high-school as a bad trait for all unsuitability attrition categories except substance abuse attrition. For the substance abuse attrition, recruits having only conduct waivers as a bad trait are the worst group. Based on these findings after the ideal group Army should enlist recruits from the low AFQT group (**“No conduct waiver — high school or above — low AFQT”**) to decrease unsuitability attrition. When we compare recruits with two bad traits, we see that recruits having both no high school diploma and low AFQT scores as bad traits have lower unsuitability attrition rates in all categories except behavior-related attrition (narrow). Army should enlist recruits from the low AFQT group (**“No conduct waiver — no high school — low AFQT”**) to decrease the unsuitability attrition rates. Recruits having both conduct waivers and low AFQT scores as bad traits are better in terms of behavior related attrition (narrow) but they have the worst results in substance abuse attrition. Recruits having both conduct waivers and no high-school diploma as bad traits are the worst group in all unsuitability attrition categories except the substance abuse attrition. We can see that the effect of not having a high school diploma on unsuitability attrition is bigger than having a conduct waiver except substance abuse attrition. Not

having a high school diploma and having a conduct waiver has larger effects on unsuitability attrition than low AFQT scores. So when they come together they form the worst categories in terms of unsuitability attrition.

Our general finding that those with a conduct waiver are less likely to attrite than those without a high school diploma does not necessarily suggest that priority should be given to the recruits with conduct waivers even if this would help to improve attrition and unsuitability attrition. Enlisting recruits with conduct waivers can have some sociological effects on military and individuals, such as diminishing the public image of military, sending the wrong message to potential recruits, and reducing the unit morale or motivation of other recruits. These factors should also be taken into account in making cost benefit analysis of increasing the number of recruits with a conduct waiver and a high school diploma or above education.

When we analyzed the educational credentials of recruits with and without conduct waivers, it can be seen that educational credentials of recruits with conduct waivers are slightly poorer (see Table 9). Even the average AFQT scores of recruits with conduct waivers are higher — 80.6% of them hold high school education or more compared to 82.4% of recruits without waivers in whole sample. When this study analyzed the restricted sample, 76.1% of recruits with conduct waivers had a high school or more education compared to 82.9% of recruits without waivers. Thus, the “whole person” policy should be applied more carefully for recruits with conduct waivers. The priority should be given to high school graduates in the pool of recruits with conduct waivers more than the current status quo. Because, in terms of “whole person” policy, recruit who do not have high educational standards, but do have conduct waivers should possess some very important assets to enlist. These assets can only be discovered by closely investigating the nature of the crime or drug usage, degree of rehabilitation, and the references of individuals, such as teachers, coaches, and employers. This could keep Army recruiting employees busy in terms of working hours.

In the application of the “whole person” policy on conduct waivers, some restrictions should be made. This could be only accepting high school diplomas or more educational credentials holders — regardless of AFQT scores. When recruits without a

high school diploma are compared, regardless of the AFQT score, it can be seen that, in terms of attrition, recruits with conduct waivers have some better results in all three attrition points compared to recruits without waivers. However, in terms of unsuitability attrition, recruits with conduct waivers are the worst categories. Since the recruits with conduct waivers and without high school diplomas, regardless of AFQT score, form 1.6% of the sample, we do not think that Army is desperately in need of this segment. In recent years, except 2005, the Army has met its recruiting targets. Additionally, in 2006, it is seen that the Army exceeded its 80,000 target by 635 recruits who equals 0.8% (Garamone, 2006). By avoiding the accessions of recruits with conduct waivers and without a high school diploma, the Army can transfer precious screening efforts to other recruits--especially recruits with conduct waivers and with high school diplomas or above education. Further work could investigate the interactions of conduct waivers on the subcategories of the education and alternative educational credentials, such as GED and certificate programs which are growing in popularity.

Within the subcategories of conduct waivers, recruits with drug waivers form the worst categories in terms of both attrition and unsuitability attrition. The relationship between the reason of the waiver and the separation is also clearly seen in the drug waivers for substance abuse-related attrition. This can be explained by the intrinsic difference of addiction behavior which can also be seen in the smoking addiction — attrition relationship (Eitelberg & Flyer, 2005). Also, drug usage can easily be screened with in-service tests. It is, however, not easy to screen behavioral infractions. According to the results, recruits with drug waivers are in need of a better pre-screening and also post-screening than the recruits with other waivers. Since all of these additional screening processes add considerably to the costs, the question is whether it is worth enlisting these recruits. In the guidance of the “whole person” policy, only higher educational standards, combined with high AFQT scores and very positive degree of rehabilitation and references, can justify their acceptance to the Army ranks. Further analysis can be helpful to decide if there is a relationship between the severity of addiction and the types of drug waivers, such as alcohol, marijuana, or other drug usage.

APPENDIX A. INTERSERVICE SEPARATION CODES AND ATTRITION DETERMINATION

Sep Code	Description	Attrition	Unsuitability Attrition	Behavior-Related Attrition-Narrow-	Behavior-Related Attrition-Broad-	Substance Abuse Attrition
1000	Unknown or not applicable	Yes	No	No	No	No
1001	Expiration of term of service	No	No	No	No	No
1002	Early release, insufficient retainability	Yes	No	No	No	No
1003	Early release to attend school	No	No	No	No	No
1005	Early release in the national interest	No	No	No	No	No
1008	Early release, other, including RIF, VSI, and SSB	No	No	No	No	No
1010	Condition existing prior to service	Yes	No	No	No	No
1011	Disability, severance pay	Yes	No	No	No	No
1012	Permanent disability retirement	Yes	No	No	No	No
1013	Temporary disability retirement	Yes	No	No	No	No
1014	Disability, no condition existing prior to service, no severance pay	Yes	No	No	No	No
1016	Unqualified for active duty, other	Yes	No	No	No	No
1017	Failure to meet weight or body fat standards	Yes	No	No	No	No
1022	Dependency or hardship	Yes	No	No	No	No
1030	Death, battle casualty	No	No	No	No	No
1031	Death, non-battle, disease	No	No	No	No	No
1032	Death, non-battle, other	No	No	No	No	No
1050	Retirement, 20 to 30 years of service	No	No	No	No	No
1052	Retirement, other	No	No	No	No	No
1060	Character or behavior disorder	Yes	Yes	Yes	Yes	No
1064	Alcoholism	Yes	Yes	No	Yes	Yes
1065	Discreditable incidents, civilian, or military	Yes	Yes	Yes	Yes	No
1067	Drugs	Yes	Yes	No	Yes	Yes
1071	Civil court conviction	Yes	Yes	Yes	Yes	No
1072	Security	Yes	Yes	No	No	No
1073	Court martial	Yes	Yes	Yes	Yes	No
1074	Fraudulent entry	Yes	Yes	No	No	No
1075	AWOL or desertion	Yes	Yes	Yes	Yes	No
1076	Homosexuality	Yes	Yes	No	No	No
1077	Sexual perversion	Yes	Yes	No	No	No
1078	Good of the service (discharge in lieu of court material)	Yes	Yes	Yes	Yes	No
1080	Misconduct, reason unknown	Yes	Yes	Yes	Yes	No
1082	Unsuitability, reason unknown	Yes	Yes	No	No	No
1083	Pattern of minor disciplinary infractions	Yes	Yes	Yes	Yes	No
1084	Commission of a serious offense	Yes	Yes	Yes	Yes	No
1085	Failure to meet minimum qualifications for retention	Yes	Yes	No	No	No

1086	Unsatisfactory performance	Yes	Yes	No	No	No
1087	Entry level performance and conduct	Yes	No	No	No	No
1090	Secretarial authority	Yes	No	No	No	No
1091	Erroneous enlistment or induction	Yes	No	No	No	No
1092	Sole surviving family member	Yes	No	No	No	No
1094	Pregnancy	Yes	No	No	No	No
1095	Minority (underage)	Yes	No	No	No	No
1096	Conscientious objector	Yes	No	No	No	No
1097	Parenthood	Yes	No	No	No	No
1098	Breach of contract	Yes	No	No	No	No
1099	Other	Yes	No	No	No	No
1100	Immediate reenlistment	No	No	No	No	No
1101	Dropped from strength, desertion	Yes	Yes	Yes	Yes	No
1102	Dropped from strength, imprisonment	Yes	Yes	Yes	Yes	No
1105	Dropped from strength, other	Yes	Yes	Yes	Yes	No

APPENDIX B. EDUCATIONAL LEVEL CODES AND EDUCATION CATEGORIES DETERMINATION

Value	Description	Category	% of Sample
11	Non-high school graduate	NHS	1.50%
12	Attending high school, junior or less	NHS	N/A
14	Secondary school credential near completion	NHS	0.05%
23	Correspondence school diploma	NHS	0.01%
22	Occupational program certificate	NHS	0.86%
21	Test-based equivalency diploma	NHS	12.24%
13	Attending high school, senior	NHS	N/A
24	High school certificate of attendance	NHS	0.03%
32	Completed high school-- no diploma	NHS	N/A
28	Other non-traditional high school credential	NHS	0.01%
27	ARNG Challenge Program GED Certificate	NHS	1.31%
62	Post- Master's degree	MHS	0.01%
61	Master's degree	MHS	0.25%
51	Baccalaureate degree	MHS	3.36%
45	Professional nursing diploma	MHS	0.01%
44	Associate degree	MHS	1.58%
41	Completed one semester of college, no high school diploma	MHS	2.86%
31	High school diploma	HS	74.42%
26	Adult education diploma	NHS	1.01%
25	Home study diploma	NHS	0.46%
43	1-2 years of college, no degree	MHS	N/A
65	Post doctorate degree	MHS	0.00%
64	Doctorate degree	MHS	0.02%
63	First professional degree	MHS	0.01%

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APPENDIX C. ENLISTMENT WAIVER CODES

Code	Description	Waiver Type
AYA	Age maximum exceeded for enlistment purposes waiver granted by the highest authority level.	Other Waiver
AYB	Age maximum exceeded for enlistment purposes waiver granted by the Recruiting Command Headquarters level.	Other Waiver
AYC	Age maximum exceeded for enlistment purposes waiver granted by the U.S. Marine Corps Command level.	Other Waiver
AYD	Age maximum exceeded for enlistment purposes waiver granted by the U.S. Army Brigade, U.S. Marine Corps District, U.S. Navy Area, or U.S. Air Force Group level.	Other Waiver
AYE	Age maximum exceeded for enlistment purposes waiver granted by the U.S. Army Battalion, U.S. Navy District, U.S. Air Force Squadron level, or U.S. Marine Corps Recruiting Station.	Other Waiver
AYF	Age maximum exceeded for enlistment purposes waiver granted by the U.S. Coast Guard Recruiting Center.	Other Waiver
BAA	Dependency of a military spouse waiver granted by the highest authority level.	Other Waiver
BAB	Dependency of a military spouse waiver granted by the Recruiting Command Headquarters level.	Other Waiver
BAC	Dependency of a military spouse waiver granted by the U.S. Marine Corps Regional Command level.	Other Waiver
BAD	Dependency of a military spouse waiver granted by the U.S. Army Brigade, U.S. Marine Corps District, U.S. Navy Area, or U.S. Air Force Group level.	Other Waiver
BAE	Dependency of a military spouse waiver granted by the U.S. Army Battalion, U.S. Navy District, U.S. Air Force Squadron level, or U.S. Marine Corps Recruiting Station.	Other Waiver
BAF	Dependency of a military spouse waiver granted by the U.S. Coast Guard Recruiting Center.	Other Waiver
BBA	Dependency due to number of dependents waiver granted by the highest authority level.	Other Waiver
BBB	Dependency due to number of dependents waiver granted by the Recruiting Command Headquarters level.	Other Waiver
BBC	Dependency due to number of dependents waiver granted by the U.S. Marine Corps Regional Command level.	Other Waiver
BBD	Dependency due to number of dependents waiver granted by the U.S. Army Brigade, U.S. Marine Corps District, U.S. Navy Area, or U.S. Air Force Group level.	Other Waiver
BBE	Dependency due to number of dependents waiver granted by the U.S. Army Battalion, U.S. Navy District, U.S. Air Force Squadron level, or U.S. Marine Corps Recruiting Station.	Other Waiver
BBF	Dependency due to number of dependents waiver granted by the U.S. Coast Guard Recruiting Center.	Other Waiver
CYA	Mental qualification—meets ASVAB testing requirements (AFQT & sub test) waiver granted by the highest authority level.	Medical Waiver

CYB	Mental qualification—meets ASVAB testing requirements (AFQT & sub test) waiver granted by the Recruiting Command Headquarters level.	Medical Waiver
CYC	Mental qualification—meets ASVAB testing requirements (AFQT & sub test) waiver granted by the U.S. Marine Corps Regional Command level.	Medical Waiver
CYD	Mental qualification—meets ASVAB testing requirements (AFQT & sub test) waiver granted by the U.S. Army Brigade U.S. Marine Corps District, U.S. Navy Area, or U.S. Air Force Group level.	Medical Waiver
CYE	Mental qualification—meets ASVAB testing requirements (AFQT & sub test) waiver granted by the U.S. Army Battalion, U.S. Navy District, U.S. Marine Corps Recruiting Station, or U.S. Air Force Squadron level.	Medical Waiver
CYF	Mental qualification—meets ASVAB testing requirements (AFQT & sub test) waiver granted by the U.S. Coast Guard Recruiting Center.	Medical Waiver
DAA	Law violations of adjudicated minor traffic offense(s) waiver granted by the highest authority level.	Minor Traffic Conduct Waiver
DAB	Law violations of adjudicated minor traffic offense(s) waiver granted by the Recruiting Command Headquarters level.	Minor Traffic Conduct Waiver
DAC	Law violations of adjudicated minor traffic offense(s) waiver granted by the U.S. Marine Corps Regional Command level.	Minor Traffic Conduct Waiver
DAD	Law violations of adjudicated minor traffic offense(s) waiver granted by the U.S. Army Brigade, U.S. Marine Corps District, U.S. Navy Area, or U.S. Air Force Group level.	Minor Traffic Conduct Waiver
DAE	Law violations of adjudicated minor traffic offense(s) waiver granted by the U.S. Army Battalion, U.S. Navy District, U.S. Marine Corps Recruiting Station, or U.S. Air Force Squadron level.	Minor Traffic Conduct Waiver
DAF	Law violations of adjudicated minor traffic offense(s) waiver granted by the U.S. Coast Guard Recruiting Center.	Minor Traffic Conduct Waiver
DBA	Law violations of adjudicated serious traffic offense(s) waiver granted by the highest authority level.	Serious Traffic Conduct Waiver
DBB	Law violations of adjudicated serious traffic offense(s) waiver granted by the Recruiting Command Headquarters level.	Serious Traffic Conduct Waiver
DBC	Law violations of adjudicated serious traffic offense(s) waiver granted by the U.S. Marine Corps Regional Command level.	Serious Traffic Conduct Waiver
DBD	Law violations of adjudicated serious traffic offense(s) waiver granted by the U.S. Army Brigade, U.S. Marine Corps District, U.S. Navy Area, or U.S. Air Force Group level.	Serious Traffic Conduct Waiver
DBE	Law violations of adjudicated serious traffic offense(s) waiver granted by the U.S. Army Battalion, U.S. Navy District, U.S. Marine Corps Recruiting Station, or U.S. Air Force Squadron level.	Serious Traffic Conduct Waiver
DBF	Law violations of adjudicated serious traffic offense(s) waiver granted by U.S. Coast Guard Recruiting Center.	Serious Traffic Conduct Waiver
DCA	Law violations of adjudicated minor non traffic offense(s) waiver granted by the highest authority level.	Minor Non-Traffic Conduct Waiver
DCB	Law violations of adjudicated minor non traffic offense(s) waiver granted by the Recruiting Command Headquarters level.	Minor Non-Traffic Conduct Waiver

DCC	Law violations of adjudicated minor non traffic offense(s) waiver granted by the U.S. Marine Corps Regional Command level.	Minor Non-Traffic Conduct Waiver
DCD	Law violations of adjudicated minor non traffic offense(s) waiver granted by the U.S. Army Brigade, U.S. Marine Corps District, U.S. Navy Area, or U.S. Air Force Group level.	Minor Non-Traffic Conduct Waiver
DCE	Law violations of adjudicated minor non traffic offense(s) waiver granted by the U.S. Army Battalion, U.S. Navy District, U.S. Marine Corps Recruiting Station, or U.S. Air Force Squadron level.	Minor Non-Traffic Conduct Waiver
DCF	Law violations of adjudicated minor non traffic offense(s) waiver granted by the U.S. Coast Guard Recruiting Center.	Minor Non-Traffic Conduct Waiver
DDA	Law violations of adjudicated serious non traffic offense(s) waiver granted by the highest authority level.	Serious Non-Traffic Conduct Waiver
DDB	Law violations of adjudicated serious non traffic offense(s) waiver granted by the Recruiting Command Headquarters level.	Serious Non-Traffic Conduct Waiver
DDC	Law violations of adjudicated serious non traffic offense(s) waiver granted by the U.S. Marine Corps Regional Command level.	Serious Non-Traffic Conduct Waiver
DDD	Law violations of adjudicated serious non traffic offense(s) waiver granted by the U.S. Army Brigade, U.S. Marine Corps District, U.S. Navy Area, or U.S. Air Force Group level.	Serious Non-Traffic Conduct Waiver
DDE	Law violations of adjudicated serious non traffic offense(s) waiver granted by the U.S. Army Battalion, U.S. Navy District, U.S. Marine Corps Recruiting Station, or U.S. Air Force Squadron level.	Serious Non-Traffic Conduct Waiver
DDF	Law violations of adjudicated serious non traffic offense(s) waiver granted by the U.S. Coast Guard Recruiting Center.	Serious Non-Traffic Conduct Waiver
DEA	Law violations of adjudicated felony offense(s) as an adult waiver granted by the highest authority level.	Felony Conduct Waiver
DEB	Law violations of adjudicated felony offense(s) as an adult waiver granted by the Recruiting Command Headquarters level.	Felony Conduct Waiver
DEC	Law violations of adjudicated felony offense(s) as an adult waiver granted by the U.S. Marine Corps Regional Command level.	Felony Conduct Waiver
DED	Law violations of adjudicated felony offense(s) as an adult waiver granted by the U.S. Army Brigade, U.S. Marine Corps District, U.S. Navy Area, or U.S. Air Force Group level.	Felony Conduct Waiver
DEE	Law violations of adjudicated felony offense(s) as an adult waiver granted by the U.S. Army Battalion, U.S. Navy District, U.S. Marine Corps Recruiting Station, or U.S. Air Force Squadron level.	Felony Conduct Waiver
DEF	Law violations of adjudicated felony offense(s) as an adult waiver granted by the U.S. Coast Guard Recruiting Center.	Felony Conduct Waiver
DFA	Law violations of adjudicated felony offense(s) as a juvenile waiver granted by the highest authority level.	Felony Conduct Waiver
DFB	Law violations of adjudicated felony offense(s) as a juvenile waiver granted by the Recruiting Command Headquarters level.	Felony Conduct Waiver
DFC	Law violations of adjudicated felony offense(s) as a juvenile waiver granted by the U.S. Marine Corps Regional Command level.	Felony Conduct Waiver

DFD	Law violations of adjudicated felony offense(s) as a juvenile waiver granted by the U.S. Army Brigade, U.S. Marine Corps District, U.S. Navy Area, or U.S. Air Force Group level.	Felony Conduct Waiver
DFE	Law violations of adjudicated felony offense(s) as a juvenile waiver granted by the U.S. Army Battalion, U.S. Navy District, U.S. Marine Corps Recruiting Station, or U.S. Air Force Squadron level.	Felony Conduct Waiver
DFF	Law violations of adjudicated felony offense(s) as a juvenile waiver granted by the U.S. Coast Guard Recruiting Center.	Felony Conduct Waiver
EAA	Previous military separation, does not apply to Delayed Entry Program separation, reenlistment eligibility reason waiver granted by the highest authority level.	Other Waiver
EAB	Previous military separation, does not apply to Delayed Entry Program separation, reenlistment eligibility reason waiver granted by the Recruiting Command Headquarters level	Other Waiver
EAC	Previous military separation, does not apply to Delayed Entry Program separation, reenlistment eligibility reason waiver granted by the U.S. Marine Corps Regional Command level.	Other Waiver
EAD	Previous military separation, does not apply to Delayed Entry Program separation, reenlistment eligibility reason waiver granted by the U.S. Army Brigade, U.S. Marine Corps District, U.S. Navy Area, or U.S. Air Force Group level.	Other Waiver
EAE	Previous military separation, does not apply to Delayed Entry Program separation, reenlistment eligibility reason waiver granted by the U.S. Army Battalion, U.S. Navy District, U.S. Marine Corps Recruiting Station, or U.S. Air Force Squadron level.	Other Waiver
EAF	Previous military separation, does not apply to Delayed Entry Program separation, reenlistment eligibility reason waiver granted by the U.S. separation, reenlistment eligibility reason waiver granted by the U.S. Coast Guard Recruiting Center.	Other Waiver
EBA	Previous military separation, does not apply to Delayed Entry Program separation, pay grade waiver granted by the highest authority level.	Other Waiver
EBB	Previous military separation, does not apply to Delayed Entry Program separation, pay grade waiver granted by the Recruiting Command Headquarters level.	Other Waiver
EBC	Previous military separation, does not apply to Delayed Entry Program separation, pay grade waiver granted by the U.S. Marine Corps Regional Command level.	Other Waiver
EBD	Previous military separation, does not apply to Delayed Entry Program separation, pay grade waiver granted by the U.S. Army Brigade, U.S. Marine Corps District, U.S. Navy Area, or U.S. Air Force Group level.	Other Waiver
EBE	Previous military separation, does not apply to Delayed Entry Program separation, pay grade waiver granted by the U.S. Army Battalion, U.S. Navy District, U.S. Marine Corps Recruiting Station, or U.S. Air Force Squadron level.	Other Waiver
EBF	Previous military separation, does not apply to Delayed Entry Program separation, pay grade waiver granted by the U.S. Coast Guard Recruiting Center.	Other Waiver
ECA	Previous military separation, does not apply to Delayed Entry Program separation, lost time waiver granted by the highest authority level.	Other Waiver

ECB	Previous military separation, does not apply to Delayed Entry Program separation, lost time waiver granted by the Recruiting Command Headquarters level.	Other Waiver
ECC	Previous military separation, does not apply to Delayed Entry Program separation, lost time waiver granted by the U.S. Marine Corps Regional Command level.	Other Waiver
ECD	Previous military separation, does not apply to Delayed Entry Program separation, lost time waiver granted by the U.S. Army Brigade, U.S. Marine Corps District, U.S. Navy Area, or U.S. Air Force Group level.	Other Waiver
ECE	Previous military separation, does not apply to Delayed Entry Program separation, lost time waiver granted by the U.S. Army Battalion, U.S. Navy District, U.S. Marine Corps Recruiting Station, or U.S. Air Force Squadron level.	Other Waiver
ECF	Previous military separation, does not apply to Delayed Entry Program separation, lost time waiver granted by the U.S. Coast Guard Recruiting Center.	Other Waiver
EDA	Previous military separation, does not apply to Delayed Entry Program separation, condition that existed prior to service waiver granted by the highest authority level.	Other Waiver
EDB	Previous military separation, does not apply to Delayed Entry Program separation, condition that existed prior to service waiver granted by the Recruiting Command Headquarters level.	Other Waiver
EDC	Previous military separation, does not apply to Delayed Entry Program separation, condition that existed prior to service waiver granted by the U.S. Marine Corps Regional Command level.	Other Waiver
EDD	Previous military separation, does not apply to Delayed Entry Program separation, condition that existed prior to service waiver granted by the U.S. Army Brigade, U.S. Marine Corps District, U.S. Navy Area, or U.S. Air Force Group level.	Other Waiver
EDE	Previous military separation, does not apply to Delayed Entry Program separation, condition that existed prior to service waiver granted by the U.S. Army Battalion, U.S. Navy District, U.S. Marine Corps Recruiting Station, or U.S. Air Force Squadron level.	Other Waiver
EDF	Previous military separation, does not apply to Delayed Entry Program separation, condition that existed prior to service waiver granted by the U.S. Coast Guard Recruiting Center.	Other Waiver
EEA	Previous military separation, does not apply to Delayed Entry Program separation, skill requirement waiver granted by the highest authority level.	Other Waiver
EEB	Previous military separation, does not apply to Delayed Entry Program separation, skill requirement waiver granted by the Recruiting Command Headquarters level.	Other Waiver
EEC	Previous military separation, does not apply to Delayed Entry Program separation, skill requirement waiver granted by the U.S. Marine Corps Regional Command level.	Other Waiver
EED	Previous military separation, does not apply to Delayed Entry Program separation, skill requirement waiver granted by the U.S. Army Brigade, U.S. Marine Corps District, U.S. Navy Area, or U.S. Air Force Group level.	Other Waiver

EEE	Previous military separation, does not apply to Delayed Entry Program separation, skill requirement waiver granted by the U.S. Army Battalion, U.S. Navy District, U.S. Marine Corps Recruiting Station, or U.S. Air Force Squadron level.	Other Waiver
EEF	Previous military separation, does not apply to Delayed Entry Program separation, skill requirement waiver granted by the U.S. Coast Guard Recruiting Center.	Other Waiver
FAA	Drug involvement not considered a law violation with alcohol abuse waiver granted by the highest authority level.	Drug Conduct Waiver
FAB	Drug involvement not considered a law violation with alcohol abuse waiver granted by the Recruiting Command Headquarters level.	Drug Conduct Waiver
FAC	Drug involvement not considered a law violation with alcohol abuse waiver granted by the U.S. Marine Corps Regional Command level.	Drug Conduct Waiver
FAD	Rug involvement not considered a law violation with alcohol abuse waiver granted by the U.S. Army Brigade, U.S. Marine Corps District, U.S. Navy Area, or U.S. Air Force Group level.	Drug Conduct Waiver
FAE	Drug involvement not considered a law violation with alcohol abuse waiver granted by the U.S. Army Battalion, U.S. Navy District, U.S. Marine Corps Recruiting Station, or U.S. Air Force Squadron level.	Drug Conduct Waiver
FAF	Drug involvement not considered a law violation with alcohol abuse waiver granted by the U.S. Coast Guard Recruiting Center.	Drug Conduct Waiver
FBA	Drug involvement not considered a law violation with marijuana usage waiver granted by the highest authority level.	Drug Conduct Waiver
FBB	Drug involvement not considered a law violation with marijuana usage waiver granted by the Recruiting Command Headquarters level.	Drug Conduct Waiver
FBC	Drug involvement not considered a law violation with marijuana usage waiver granted by the U.S. Marine Corps Regional Command level.	Drug Conduct Waiver
FBD	Drug involvement not considered a law violation with marijuana usage waiver granted by the U.S. Army Brigade, U.S. Marine Corps District, U.S. Navy Area, or U.S. Air Force Group level.	Drug Conduct Waiver
FBE	Drug involvement not considered a law violation with marijuana usage waiver granted by the U.S. Army Battalion, U.S. Navy District, U.S. Marine Corps Recruiting Station, or U.S. Air Force Squadron level.	Drug Conduct Waiver
FBF	Drug involvement not considered a law violation with marijuana usage waiver granted by the U.S. Coast Guard Recruiting Center.	Drug Conduct Waiver
FCA	Drug involvement not considered a law violation with other drug usage waiver granted by the highest authority level.	Drug Conduct Waiver
FCB	Drug involvement not considered a law violation with other drug usage waiver granted by the Recruiting Command Headquarters level.	Drug Conduct Waiver
FCC	Drug involvement not considered a law violation with other drug usage waiver granted by the U.S. Marine Corps Regional Command level.	Drug Conduct Waiver

FCD	Drug involvement not considered a law violation with other drug usage waiver granted by the U.S. Army Brigade, U.S. Marine Corps District, U.S. Navy Area, or U.S. Air Force Group level.	Drug Conduct Waiver
FCE	Drug involvement not considered a law violation with other drug usage waiver granted by the U.S. Army Battalion, U.S. Navy District, U.S. Marine Corps Recruiting Station, or U.S. Air Force Squadron level.	Drug Conduct Waiver
FCF	Drug involvement not considered a law violation with other drug usage waiver granted by the U.S. Coast Guard Recruiting Center.	Drug Conduct Waiver
FDA	Drug involvement not considered a law violation with drug and alcohol test positive waiver granted by the highest authority level.	Drug Conduct Waiver
FDB	Drug involvement not considered a law violation with drug and alcohol test positive waiver granted by the Recruiting Command Headquarters level.	Drug Conduct Waiver
FDC	Drug involvement not considered a law violation with drug and alcohol test positive waiver granted by the U.S. Marine Corps Regional Command level.	Drug Conduct Waiver
FDD	Drug involvement not considered a law violation with drug and alcohol test positive waiver granted by the U.S. Army Brigade, U.S. Marine Corps District, U.S. Navy Area, or U.S. Air Force Group level.	Drug Conduct Waiver
FDE	Drug involvement not considered a law violation with drug and alcohol test positive waiver granted by the U.S. Army Battalion, U.S. Navy District, U.S. Marine Corps Recruiting Station, or U.S. Air Force Squadron level.	Drug Conduct Waiver
FDF	Drug involvement not considered a law violation with drug and alcohol test positive waiver granted by the U.S. Coast Guard Recruiting Center.	Drug Conduct Waiver
HAA	Medical disqualification height waiver by the highest authority level.	Medical Waiver
HAB	Medical disqualification height waiver granted by the Recruiting Command Headquarters level.	Medical Waiver
HAC	Medical disqualification height waiver granted by the U.S. Marine Corps Regional Command level.	Medical Waiver
HAD	Medical disqualification height waiver granted by the U.S. Army Brigade, U.S. Marine Corps District, U.S. Navy Area, or U.S. Air Force Group level.	Medical Waiver
HAE	Medical disqualification height waiver granted by the U.S. Army Battalion, U.S. Navy District, U.S. Marine Corps Recruiting Station, or U.S. Air Force Squadron level.	Medical Waiver
HAF	Medical disqualification height waiver granted by the U.S. Coast Guard Recruiting Center.	Medical Waiver
HBA	Medical disqualification weight waiver granted by the highest authority level.	Medical Waiver
HBB	Medical disqualification weight waiver granted by the Recruiting Command Headquarters level.	Medical Waiver
HBC	Medical disqualification weight waiver granted by the U.S. Marine Corps Regional Command level.	Medical Waiver
HBD	Medical disqualification weight waiver granted by the U.S. Army Brigade, U.S. Marine Corps District, U.S. Navy Area, or U.S. Air Force Group level.	Medical Waiver

HBE	Medical disqualification weight waiver granted by the U.S. Army Battalion, U.S. Navy District, U.S. Marine Corps Recruiting Station, or U.S. Air Force Squadron level.	Medical Waiver
HBF	Medical disqualification weight waiver granted by the U.S. Coast Guard Recruiting Center.	Medical Waiver
HCA	Medical disqualification disease classification (ICD-9) waiver granted by the highest authority level.	Medical Waiver
HCB	Medical disqualification disease classification (ICD-9) waiver granted by the Recruiting Command Headquarters level.	Medical Waiver
HCC	Medical disqualification disease classification (ICD-9) waiver granted by the U.S. Marine Corps Regional Command level.	Medical Waiver
HCD	Medical disqualification disease classification (ICD-9) waiver granted by the U.S. Army Brigade, U.S. Marine Corps District, U.S. Navy Area, or U.S. Air Force Group level.	Medical Waiver
HCE	Medical disqualification disease classification (ICD-9) waiver granted by the U.S. Army Battalion, U.S. Navy District, U.S. Marine Corps Recruiting Station, or U.S. Air Force Squadron level.	Medical Waiver
HCF	Medical disqualification disease classification (ICD-9) waiver granted by the U.S. Coast Guard Recruiting Center.	Medical Waiver
JYA	Sole surviving family member waiver granted by the highest authority level.	Other Waiver
JYB	Sole surviving family member waiver granted by the Recruiting Command Headquarters level.	Other Waiver
JYC	Sole surviving family member waiver granted by the U.S. Marine Corps Regional Command level.	Other Waiver
JYD	Sole surviving family member waiver granted by the U.S. Army Brigade, U.S. Marine Corps District, U.S. Navy Area, or U.S. Air Force Group level.	Other Waiver
JYE	Sole surviving family member waiver granted by the U.S. Army Battalion, U.S. Navy District, U.S. Marine Corps Recruiting Station, or U.S. Air Force Squadron level.	Other Waiver
JYF	Sole surviving family member waiver granted by the U.S. Coast Guard Recruiting Center.	Other Waiver
KYA	Minimum education requirement waiver granted by the highest authority level.	Other Waiver
KYB	Minimum education requirement waiver granted by the Recruiting Command Headquarters level.	Other Waiver
KYC	Minimum education requirement waiver granted by the U.S. Marine Corps Regional Command level.	Other Waiver
KYD	Minimum education requirement waiver granted by the U.S. Army Brigade, U.S. Marine Corps District, U.S. Navy Area, or U.S. Air Force Group level.	Other Waiver
KYE	Minimum education requirement waiver granted by the U.S. Army Battalion, U.S. Navy District, U.S. Marine Corps Recruiting Station, or U.S. Air Force Squadron level.	Other Waiver
KYF	Minimum education requirement waiver granted by the U.S. Coast Guard Recruiting Center.	Other Waiver
LYA	Aliens who have traveled or resided in a nation whose interests are inimical to those of the United States (also applies to aliens whose spouse, parent, brother, sister, or children currently reside in such a nation) waiver granted by the highest authority level.	Other Waiver

LYB	Aliens who have traveled or resided in a nation whose interests are inimical to those of the United States (also applies to aliens whose spouse, parent, brother, sister, or children currently reside in such a nation) waiver granted by the Recruiting Command Headquarters level.	Other Waiver
LYC	Aliens who have traveled or resided in a nation whose interests are inimical to those of the United States (also applies to aliens whose spouse, parent, brother, sister, or children currently reside in such a nation) waiver granted by the U.S. Marine Corps Regional Command level.	Other Waiver
LYD	Aliens who have traveled or resided in a nation whose interests are inimical to those of the United States (also applies to aliens whose spouse, parent, brother, sister, or children currently reside in such a nation) waiver granted by the U.S. Army Brigade, U.S. Marine Corps District, U.S. Navy Area, or U.S. Air Force Group level.	Other Waiver
LYE	Aliens who have traveled or resided in a nation whose interests are inimical to those of the United States (also applies to aliens whose spouse, parent, brother, sister, or children currently reside in such a nation) waiver granted by the U.S. Army Battalion, U.S. Navy District, U.S. Marine Corps Recruiting Station, or U.S. Air Force Squadron level.	Other Waiver
LYF	Aliens who have traveled or resided in a nation whose interests are inimical to those of the United States (also applies to aliens whose spouse, parent, brother, sister, or children currently reside in such a nation) waiver granted by the U.S. Coast Guard Recruiting Center.	Other Waiver
MYA	Refusal or failure to complete a loyalty certificate (includes derogatory information entered on a loyalty certificate) waiver granted by the highest authority level.	Other Waiver
MYB	Refusal or failure to complete a loyalty certificate (includes derogatory information entered on a loyalty certificate) waiver granted by the Recruiting Command Headquarters level.	Other Waiver
MYC	Refusal or failure to complete a loyalty certificate (includes derogatory information entered on a loyalty certificate) waiver granted by the U.S. Marine Corps Regional Command level.	Other Waiver
MYD	Refusal or failure to complete a loyalty certificate (includes derogatory information entered on a loyalty certificate) waiver granted by the U.S. Army Brigade, U.S. Marine Corps District, U.S. Navy Area, or U.S. Air Force Group level.	Other Waiver
MYE	Refusal or failure to complete a loyalty certificate (includes derogatory information entered on a loyalty certificate) waiver granted by the U.S. Army Battalion, U.S. Navy District, U.S. Marine Corps Recruiting Station, or U.S. Air Force Squadron level.	Other Waiver
MYF	Refusal or failure to complete a loyalty certificate (includes derogatory information entered on a loyalty certificate) waiver granted by the U.S. Coast Guard Recruiting Center.	Other Waiver
NYA	Conscientious objector waiver granted by the highest authority level.	Other Waiver
NYB	Conscientious objector waiver granted by the Recruiting Command Headquarters level	Other Waiver
NYC	Conscientious objector waiver granted by the U.S. Marine Corps Regional Command level.	Other Waiver

NYD	Conscientious objector waiver granted by the U.S. Army Brigade, U.S. Marine Corps District, U.S. Navy Area, or U.S. Air Force Group level.	Other Waiver
NYE	Conscientious objector waiver granted by the U.S. Army Battalion, U.S. Navy District, U.S. Marine Corps Recruiting Station, or U.S. Air Force Squadron level.	Other Waiver
NYF	Conscientious objector waiver granted by the U.S. Coast Guard Recruiting Center.	Other Waiver
PYA	Army service administrative waiver—service unique waiver policy granted at the highest authority level.	Other Waiver
PYB	Army service administrative waiver—service unique waiver policy granted at the recruiting headquarters level.	Other Waiver
PYD	Army service administrative waiver—service unique waiver policy granted at the army brigade level.	Other Waiver
PYE	Army service administrative waiver—service unique waiver policy granted at the army battalion level.	Other Waiver
QYA	Air force service administrative waiver—service unique waiver policy granted by the highest authority level.	Other Waiver
QYB	Air force service administrative waiver—service unique waiver policy granted by the recruiting headquarters level.	Other Waiver
QYD	Air force service administrative waiver—service unique waiver policy granted by the U.S. Air Force Group level.	Other Waiver
QYE	Air force service administrative waiver—service unique waiver policy granted by the USAF Squadron level.	Other Waiver
RYA	Navy service administrative waiver—service unique waiver policy granted at the highest authority level.	Other Waiver
RYB	Navy service administrative waiver—service unique waiver policy granted at the recruiting headquarters level.	Other Waiver
RYD	Navy service administrative waiver—service unique waiver policy granted at the navy area level.	Other Waiver
RYE	Navy service administrative waiver—service unique waiver policy granted at the navy district level.	Other Waiver
SYA	U.S. Coast Guard service administrative waiver—service unique waiver policy granted at the recruiting center level.	Other Waiver
XYA	Marine Corps service administrative waiver—service unique waiver policy granted at the highest authority level.	Other Waiver
XYB	Marine Corps service administrative waiver—service unique waiver policy granted at the recruiting headquarters level.	Other Waiver
XYC	Marine Corps service administrative waiver—service unique waiver policy granted at the regional command (USMC only) level.	Other Waiver
XYD	Marine Corps service administrative waiver—service unique waiver policy granted at the USMC District level.	Other Waiver
XYE	Marine Corps service administrative waiver —service unique waiver policy granted at the USMC Recruiting Station level.	Other Waiver
XXB	Marine Corps service administrative waiver—USMC Medical Rehabilitation Program (MREP) granted at the recruiting headquarters level.	Other Waiver
XXE	Marine Corps service administrative waiver—USMC Medical Rehabilitation Program (MREP) granted at the USMC Recruiting Station level.	Other Waiver
YYY	No condition currently exists requiring a waiver; however, there may be administrative conditions that exist.	No Waiver

APPENDIX D. 180-DAY ATTRITION MODEL REGRESSION RESULTS

180-day Attrition	1st Model (Unrestricted)	2nd Model (Unrestricted)	1st Model (Restricted)	2nd Model (Restricted)
Female	0.427** (0.009) [0.080]	0.427** (0.009) [0.080]	0.462** (0.012) [0.096]	0.462** (0.012) [0.096]
Black	-0.233** (0.010) [-0.033]	-0.233** (0.010) [-0.033]	-0.266** (0.013) [-0.042]	-0.267** (0.013) [-0.042]
Hispanic	-0.232** (0.011) [-0.032]	-0.233** (0.011) [-0.032]	-0.407** (0.017) [-0.058]	-0.408** (0.017) [-0.058]
Other race	-0.240** (0.019) [-0.032]	-0.240** (0.019) [-0.032]	-0.258** (0.038) [-0.039]	-0.259** (0.027) [-0.038]
Age	0.043** (0.011) [0.007]	0.043** (0.011) [0.007]	0.066** (0.011) [0.012]	0.066** (0.015) [0.011]
Age Square	-0.001** (0.000) [-0.000]	-0.001** (0.000) [-0.000]	-0.001** (0.000) [-0.000]	-0.001** (0.000) [-0.000]
Married	0.042* (0.017) [0.007]	0.041* (0.017) [0.007]	-0.012 (0.025) [-0.002]	-0.013 (0.025) [-0.002]
Dependents	0.016 (0.008) [0.002]	0.016 (0.008) [0.002]	0.037** (0.012) [0.006]	0.037** (0.012) [0.006]
YP	-0.396* (0.155) [-0.046]	-0.396* (0.155) [-0.046]	-0.353* (0.168) [-0.048]	-0.353* (0.168) [-0.048]
JROTC	-0.061** (0.022) [-0.009]	-0.061** (0.022) [-0.009]	-0.081** (0.026) [-0.013]	-0.081** (0.026) [-0.013]
Low AFQT	0.124** (0.008) [0.020]	0.124** (0.008) [0.020]	0.141** (0.011) [0.025]	0.141** (0.011) [0.025]
No high School Diploma	0.303** (0.009) [0.054]	0.302** (0.009) [0.054]	0.362** (0.012) [0.073]	0.362** (0.012) [0.073]
More than High School Education	-0.117** (0.014) [-0.017]	-0.117** (0.014) [-0.017]	-0.171** (0.021) [-0.027]	-0.171** (0.021) [-0.027]
Conduct Waiver	-0.098** (0.014) [-0.014]	N/A	-0.103** (0.020) [-0.017]	N/A
Medical Waiver	0.076** (0.015) [0.012]	0.076** (0.015) [0.012]	0.095** (0.023) [0.017]	0.095** (0.023) [0.017]
Other Waiver	0.074* (0.032) [0.012]	0.073* (0.032) [0.012]	-0.090 (0.050) [-0.015]	-0.090 (0.050) [-0.015]
Drug Waiver	N/A	-0.052* (0.029) [-0.008]	N/A	-0.050 (0.037) [-0.008]
Minor Traffic Waiver	N/A	0.198 (0.171)	N/A	0.270 (0.177)

		[0.035]		[0.055]
Serious Traffic Waiver	N/A	-0.266** (0.054) [-0.034]	N/A	-0.304* (0.122) [-0.043]
Minor Non-Traffic Waiver	N/A	-0.081 (0.068) [-0.012]	N/A	-0.163 (0.089) [-0.025]
Serious Non-Traffic Waiver	N/A	-0.084** (0.019) [-0.012]	N/A	-0.105** (0.028) [-0.017]
Felony Waiver	N/A	-0.130** (0.031) [-0.019]	N/A	-0.134** (0.043) [-0.021]
FY2001	-0.015 (0.012) [-0.002]	-0.016 (0.012) [-0.002]	-0.016 (0.012) [-0.003]	-0.016 (0.012) [-0.003]
FY2002	-0.120** (0.012) [-0.018]	-0.120** (0.012) [-0.018]	-0.120** (0.012) [-0.020]	-0.119** (0.012) [-0.020]
FY2003	-0.621** (0.015) [-0.072]	-0.620** (0.015) [-0.072]	N/A	N/A
FY2004	0.017 (0.011) [0.003]	0.019 (0.012) [0.003]	N/A	N/A
FY2005	-0.163** (0.012) [-0.024]	-0.163** (0.012) [-0.024]	N/A	N/A
Constant	-1.915** (0.122)	-1.919** (0.122)	-2.194** (0.174)	-2.197** (0.174)
Observations	257396	257396	120541	120541
Observed P(attrite)	0.0951	0.0951	0.1073	0.1073
Predicted P(attrite)	0.0849	0.0849	0.0983	0.0983
Absolute value of z statistics in parentheses * significant at 5%; ** significant at 1%				

APPENDIX E. 365-DAY ATTRITION MODEL REGRESSION RESULTS

365-day Attrition	1st Model (Unrestricted)	2nd Model (Unrestricted)	1st Model (Restricted)	2nd Model (Restricted)
Female	0.483** (0.008) [0.116]	0.483** (0.008) [0.116]	0.505** (0.011) [0.126]	0.505** (0.011) [0.126]
Black	-0.242** (0.009) [-0.045]	-0.243** (0.009) [-0.045]	-0.270** (0.012) [-0.052]	-0.271** (0.012) [-0.052]
Hispanic	-0.205** (0.010) [-0.038]	-0.205** (0.010) [-0.038]	-0.345** (0.015) [-0.063]	-0.345** (0.015) [-0.063]
Other race	-0.209** (0.017) [-0.038]	-0.210** (0.017) [-0.038]	-0.211** (0.025) [-0.040]	-0.211** (0.025) [-0.040]
Age	0.024** (0.010) [0.005]	0.024** (0.010) [0.005]	0.050** (0.014) [0.011]	0.050** (0.014) [0.011]
Age Square	0.000 (0.000) [-0.000]	0.000 (0.000) [-0.000]	-0.001** (0.000) [-0.000]	-0.001** (0.000) [-0.000]
Married	0.029 (0.015) [0.006]	0.029 (0.015) [0.006]	-0.018 (0.023) [-0.004]	-0.019 (0.023) [-0.004]
Dependents	0.020* (0.008) [0.004]	0.020* (0.008) [0.004]	0.040** (0.011) [0.008]	0.040** (0.011) [0.009]
YP	-0.279* (0.128) [-0.048]	-0.280* (0.128) [-0.048]	-0.312* (0.148) [-0.055]	-0.313* (0.148) [-0.055]
JROTC	-0.071** (0.020) [-0.014]	-0.070** (0.020) [-0.014]	-0.086** (0.024) [-0.017]	-0.086** (0.024) [-0.017]
Low AFQT	0.107** (0.007) [0.022]	0.107** (0.007) [0.022]	0.125** (0.010) [0.027]	0.125** (0.010) [0.027]
No High School Diploma	0.328** (0.008) [0.075]	0.328** (0.008) [0.075]	0.372** (0.011) [0.089]	0.372** (0.011) [0.089]
More than High School Diploma	-0.104** (0.013) [-0.020]	-0.103** (0.013) [-0.020]	-0.154** (0.020) [-0.030]	-0.154** (0.020) [-0.030]
Conduct Waiver	-0.045** (0.012) [-0.009]	N/A	-0.064** (0.018) [-0.013]	N/A
Medical Waiver	0.048** (0.014) [0.010]	0.049** (0.014) [0.010]	0.073** (0.021) [0.016]	0.074** (0.022) [0.016]
Other Waiver	0.048 (0.030) [0.010]	0.048 (0.030) [0.010]	-0.087 (0.047) [-0.017]	-0.087 (0.047) [-0.017]
Drug Waiver	N/A	0.062* (0.025) [0.013]	N/A	0.032 (0.033) [0.007]
Minor Traffic Waiver	N/A	0.130 (0.166)	N/A	0.204 (0.171)

		[0.028]		[0.048]
Serious Traffic Waiver	N/A	-0.222** (0.047) [-0.040]	N/A	-0.398** (0.120) [-0.066]
Minor Non-Traffic Waiver	N/A	-0.077 (0.062) [-0.015]	N/A	-0.176* (0.082) [-0.034]
Serious Non-Traffic Waiver	N/A	-0.043** (0.016) [-0.008]	N/A	-0.073** (0.026) [-0.015]
Felony Waiver	N/A	-0.105** (0.028) [-0.020]	N/A	-0.119** (0.040) [-0.023]
FY2001	0.021* (0.011) [0.004]	0.020 (0.011) [0.004]	0.021 (0.011) [0.004]	0.020 (0.011) [0.004]
FY2002	-0.171** (0.011) [-0.032]	-0.172** (0.011) [-0.033]	-0.171** (0.012) [-0.035]	-0.170** (0.012) [-0.035]
FY2003	-0.452** (0.013) [-0.076]	-0.451** (0.013) [-0.076]	N/A	N/A
FY2004	0.042** (0.011) [0.009]	0.043** (0.011) [0.009]	N/A	N/A
FY2005	-0.066** (0.011) [-0.013]	-0.066** (0.011) [-0.013]	N/A	N/A
Constant	-1.530** (0.111)	-1.533** (0.111)	-1.845** (0.162)	-1.849** (0.162)
Observations	257396	257396	120541	120541
Observed P(attrite)	0.1324	0.1324	0.1396	0.1396
Predicted P(attrite)	0.1224	0.1224	0.1297	0.1296
Absolute value of z statistics in parentheses * significant at 5%; ** significant at 1%				

APPENDIX F. FIRST TERM ATTRITION MODEL REGRESSION RESULTS

First-Term Attrition	1st Model (Restricted)	2nd Model (Restricted)
Female	0.539** (0.010) [0.195]	0.539** (0.010) [0.194]
Black	-0.163** (0.010) [-0.053]	-0.167** (0.010) [-0.054]
Hispanic	-0.248** (0.012) [-0.078]	-0.249** (0.012) [-0.078]
Other race	-0.212** (0.021) [-0.067]	-0.213** (0.021) [-0.067]
Age	0.006 (0.012) [0.002]	0.006 (0.012) [0.002]
Age Square	0.000 (0.000) [-0.000]	0.000 (0.000) [-0.000]
Married	0.015 (0.020) [0.005]	0.014 (0.020) [0.005]
Dependents	0.038** (0.010) [0.013]	0.038** (0.010) [0.013]
YP	-0.217 (0.114) [-0.068]	-0.220* (0.114) [-0.068]
JROTC	-0.087** (0.020) [-0.029]	-0.087** (0.020) [-0.028]
Low AFQT	0.064** (0.008) [0.021]	0.064** (0.008) [0.021]
No high School Diploma	0.403** (0.010) [0.144]	0.404** (0.010) [0.144]
More than High School Education	-0.179** (0.016) [-0.057]	-0.179** (0.016) [-0.057]
Conduct Waiver	0.123** (0.015) [0.042]	N/A
Medical Waiver	0.035 (0.019) [0.012]	0.037* (0.019) [0.012]
Other Waiver	-0.109** (0.040) [-0.035]	-0.110** (0.040) [-0.035]
Drug Waiver	N/A	0.330** (0.027) [0.119]

Minor Traffic Waiver	N/A	0.203 (0.153) [0.072]
Serious Traffic Waiver	N/A	-0.029 (0.082) [-0.010]
Minor Non-Traffic Waiver	N/A	0.017 (0.065) [0.006]
Serious Non-Traffic Waiver	N/A	0.036 (0.021) [0.012]
Felony Waiver	N/A	0.044 (0.032) [0.015]
FY2001	-0.111** (0.010) [-0.037]	-0.113** (0.010) [-0.037]
FY2002	-0.214** (0.010) [-0.070]	-0.214** (0.010) [-0.070]
Constant	-0.707 (0.139)	-0.710 (0.139)
Observations	120541	120541
Observed P(attrite)	0.2835	0.2835
Predicted P(attrite)	0.2762	0.2761
Absolute value of z statistics in parentheses * significant at 5%; ** significant at 1%		

APPENDIX G. ALTERNATIVE GENERAL ATTRITION MODEL REGRESSION RESULTS 1

Reference Group: Ideal Recruits (No Waiver, High School Diploma or Above, High AFQT >=50)

Restricted Sample	180-day Attrition	365-day Attrition	First Term Attrition
Female	0.458** (0.012) [0.095]	0.502** (0.011) [0.125]	0.536** (0.010) [0.193]
Black	-0.27** (0.013) [-0.042]	-0.273** (0.012) [-0.053]	-0.166** (0.010) [-0.054]
Hispanic	-0.41** (0.017) [-0.058]	-0.348** (0.015) [-0.063]	-0.249** (0.012) [-0.079]
Other Race	-0.263** (0.027) [-0.039]	-0.215** (0.025) [-0.040]	-0.216** (0.021) [-0.068]
Age	0.06** (0.015) [0.010]	0.045** (0.014) [0.009]	-0.001 (0.012) [-0.000]
Age Square	-0.001** (0.000) [-0.000]	-0.001* (0.000) [-0.000]	0.000 (0.000) [0.000]
Married	-0.018 (0.025) [-0.003]	-0.024 (0.023) [-0.005]	0.009 (0.020) [0.003]
Dependents	0.042** (0.012) [0.007]	0.044** (0.011) [0.009]	0.042** (0.010) [0.014]
YP	-0.346* (0.168) [-0.048]	-0.305* (0.148) [-0.054]	-0.209 (0.114) [-0.065]
JROTC	-0.078** (0.026) [-0.013]	-0.083** (0.024) [-0.017]	-0.083** (0.020) [-0.027]
Medical Waiver	0.095** (0.023) [0.018]	0.073** (0.022) [0.016]	0.036 (0.019) [0.012]
Other Waiver	-0.085 (0.050) [-0.014]	-0.082 (0.047) [-0.017]	-0.102* (0.040) [-0.033]
No conduct waiver, high school or above, low AFQT(<50)	0.177** (0.012) [0.032]	0.157** (0.011) [0.034]	0.087** (0.010) [0.029]
No conduct waiver, no high school, high AFQT(>=50)	0.432** (0.015) [0.092]	0.436** (0.015) [0.110]	0.47** (0.013) [0.171]
No conduct waiver, no high school, low AFQT(<50)	0.461** (0.021) [0.102]	0.46** (0.020) [0.120]	0.448** (0.018) [0.164]

Conduct waiver, high school or above, high AFOT(≥ 50)	-0.096** (0.030) [-0.016]	-0.052* (0.026) [-0.011]	0.156** (0.021) [0.054]
Conduct waiver, high school or above, low AFOT(< 50)	0.119** (0.039) [0.022]	0.136** (0.036) [0.031]	0.281** (0.029) [0.101]
Conduct waiver, no high school, high AFOT(≥ 50)	0.270** (0.039) [0.055]	0.324** (0.036) [0.081]	0.446** (0.032) [0.165]
Conduct waiver, no high school, low AFOT(< 50)	0.339** (0.076) [0.072]	0.300** (0.072) [0.074]	0.514** (0.061) [0.192]
FY2001	-0.014 (0.012) [-0.002]	0.023* (0.011) [0.005]	-0.11** (0.010) [-0.036]
FY2002	-0.122** (0.012) [-0.021]	-0.173** (0.012) [-0.035]	-0.215** (0.010) [-0.070]
Constant	-2.123** (0.173)	-1.781** (0.162)	-0.617** (0.134)
Observations	120541	120541	120541
Observed P(attrite)	0.1073	0.1395	0.2835
Predicted P(attrite)	0.0984	0.1297	0.2763
Absolute value of z statistics in parentheses * significant at 5%; ** significant at 1%			

APPENDIX H. ALTERNATIVE GENERAL ATTRITION MODEL REGRESSION RESULTS 2

Reference Group: No Waiver, No High School Diploma, High AFQT ≥ 50)

Restricted Sample	180-day Attrition	365-day Attrition	First Term Attrition
Female	0.458** (0.012) [0.095]	0.502** (0.011) [0.125]	0.536** (0.010) [0.193]
Black	-0.27** (0.013) [-0.042]	-0.273** (0.012) [-0.053]	-0.166** (0.010) [-0.054]
Hispanic	-0.41** (0.017) [-0.058]	-0.348** (0.015) [-0.063]	-0.249** (0.012) [-0.079]
Other Race	-0.263** (0.027) [-0.039]	-0.215** (0.025) [-0.040]	-0.216** (0.021) [-0.068]
Age	0.060** (0.015) [0.010]	0.045** (0.014) [0.009]	-0.001 (0.012) [-0.000]
Age Square	-0.001** (0.000) [-0.000]	-0.001* (0.000) [-0.000]	0.000 (0.000) [0.000]
Married	-0.018 (0.025) [-0.003]	-0.024 (0.023) [-0.005]	0.009 (0.020) [0.003]
Dependents	0.042** (0.012) [0.007]	0.044** (0.011) [0.009]	0.042** (0.010) [0.014]
YP	-0.346* (0.168) [-0.048]	-0.305* (0.148) [-0.054]	-0.209 (0.114) [-0.065]
JROTC	-0.078** (0.026) [-0.013]	-0.083** (0.024) [-0.017]	-0.083** (0.020) [-0.027]
Medical Waiver	0.095** (0.023) [0.018]	0.073** (0.022) [0.016]	0.036 (0.019) [0.012]
Other Waiver	-0.085 (0.050) [-0.014]	-0.082 (0.047) [-0.017]	-0.102* (0.040) [-0.033]
No conduct waiver, high school or above, high AFQT(≥ 50)	-0.432** (0.015) [-0.074]	-0.436** (0.015) [-0.091]	-0.470** (0.013) [-0.155]
No conduct waiver, high school or above low AFQT(< 50)	-0.255** (0.017) [-0.041]	-0.278** (0.016) [-0.055]	-0.383** (0.014) [-0.122]
No conduct waiver, no high school, low AFQT(< 50)	0.029 (0.024) [0.005]	0.024 (0.022) [0.005]	-0.022 (0.020) [-0.007]
Conduct waiver, high school or above, high AFQT(≥ 50)	-0.527** (0.031) [-0.066]	-0.488** (0.028) [-0.079]	-0.314** (0.023) [-0.095]
Conduct waiver,	-0.312**	-0.299**	-0.189**

	(0.041) [-0.044]	(0.038) [-0.053]	(0.031) [-0.060]
Conduct waiver, no high school, high AFOT(>=50)	-0.162** (0.041) [-0.025]	-0.112** (0.038) [-0.022]	-0.024 (0.033) [-0.008]
Conduct waiver, no high school, low AFOT(<50)	-0.092 (0.076) [-0.015]	-0.136 (0.073) [-0.026]	0.044 (0.062) [0.015]
FY2001	-0.014 (0.012) [-0.002]	0.023* (0.011) [0.005]	-0.11** (0.010) [-0.036]
FY2002	-0.122** (0.012) [-0.021]	-0.173** (0.012) [-0.035]	-0.215** (0.010) [-0.070]
Constant	-1.692** (0.173)	-1.346** (0.162)	-0.146** (0.139)
Observations	120541	120541	120541
Observed P(attrite)	0.1073	0.1395	0.2835
Predicted P(attrite)	0.0984	0.1297	0.2763
Absolute value of z statistics in parentheses * significant at 5%; ** significant at 1% *			

APPENDIX I. ALTERNATIVE GENERAL ATTRITION MODEL REGRESSION RESULTS 3

Reference Group: No Waiver, High School Diploma or Above, Low AFQT < 50)

Restricted Sample	180-day Attrition	365-day Attrition	First Term Attrition
Female	0.458** (0.012) [0.095]	0.502** (0.011) [0.125]	0.536** (0.010) [0.193]
Black	-0.27** (0.013) [-0.042]	-0.273** (0.012) [-0.053]	-0.166** (0.010) [-0.054]
Hispanic	-0.410** (0.017) [-0.058]	-0.348** (0.015) [-0.063]	-0.249** (0.012) [-0.079]
Other Race	-0.263** (0.027) [-0.039]	-0.215** (0.025) [-0.040]	-0.216** (0.021) [-0.068]
Age	0.060** (0.015) [0.010]	0.045** (0.014) [0.009]	-0.001 (0.012) [-0.000]
Age Square	-0.001** (0.000) [-0.000]	-0.001* (0.000) [-0.000]	0.000 (0.000) [0.000]
Married	-0.018 (0.025) [-0.003]	-0.024 (0.023) [-0.005]	0.009 (0.020) [0.003]
Dependents	0.042** (0.012) [0.007]	0.044** (0.011) [0.009]	0.042** (0.010) [0.014]
YP	-0.346* (0.168) [-0.048]	-0.305* (0.148) [-0.054]	-0.209 (0.114) [-0.065]
JROTC	-0.078** (0.026) [-0.013]	-0.083** (0.024) [-0.017]	-0.083** (0.020) [-0.027]
Medical Waiver	0.095** (0.023) [0.018]	0.073** (0.022) [0.016]	0.036 (0.019) [0.012]
Other Waiver	-0.085 (0.050) [-0.014]	-0.082 (0.047) [-0.017]	-0.102* (0.040) [-0.033]
No conduct waiver, high school or above, high AFQT(>=50)	-0.177** (0.012) [-0.030]	-0.157** (0.011) [-0.033]	-0.087** (0.010) [-0.029]
No conduct waiver, no high school, high AFQT(>=50)	0.255** (0.017) [0.050]	0.278** (0.016) [0.066]	0.383** (0.014) [0.138]
No conduct waiver, no high school, low AFQT(<50)	0.284** (0.022) [0.058]	0.302** (0.020) [0.074]	0.361** (0.018) [0.131]
Conduct waiver, high school or above, high AFQT(>=50)	-0.272** (0.030) [-0.040]	-0.210** (0.027) [-0.040]	0.069** (0.021) [0.023]

Conduct waiver, high school or above, low AFOT(<50)	-0.058 (0.039) [-0.010]	-0.021 (0.036) [-0.004]	0.194** (0.030) [0.068]
Conduct waiver, no high school, high AFOT(>=50)	0.093* (0.040) [0.017]	0.167** (0.037) [0.038]	0.359** (0.032) [0.130]
Conduct waiver, no high school, low AFOT(<50)	0.163* (0.076) [0.031]	0.143* (0.072) [0.033]	0.427** (0.062) [0.157]
FY2001	-0.014 (0.012) [-0.002]	0.023* (0.011) [0.005]	-0.110** (0.010) [-0.036]
FY2002	-0.122** (0.012) [-0.021]	-0.173** (0.012) [-0.035]	-0.215** (0.010) [-0.070]
Constant	-1.946** (0.173)	-1.624** (0.162)	-0.529** (0.139)
Observations	120541	120541	120541
Observed P(attrite)	0.1073	0.1395	0.2835
Predicted P(attrite)	0.0984	0.1297	0.2763
Absolute value of z statistics in parentheses * significant at 5%; ** significant at 1%			

APPENDIX J. UNSUITABILITY ATTRITION MODEL REGRESSION RESULTS

	Unsuitability Attrition	Behavior Related Attrition (Broad)	Behavior Related Attrition (Narrow)	Substance Abuse Attrition
Female	-0.391** (0.014) [-0.093]	-0.506** (0.015) [-0.105]	-0.444** (0.016) [-0.081]	-0.471** (0.030) [-0.023]
Black	0.235** (0.014) [0.066]	0.246** (0.014) [0.064]	0.199** (0.015) [0.045]	0.247** (0.023) [0.018]
Hispanic	-0.012* (0.016) [-0.003]	-0.004 (0.017) [-0.001]	-0.023 (0.018) [-0.005]	0.059* (0.028) [0.004]
Other Race	0.017 (0.028) [0.005]	0.031 (0.029) [0.008]	0.035 (0.030) [0.008]	-0.002 (0.050) [-0.000]
Age	-0.103** (0.017) [-0.027]	-0.118** (0.018) [-0.029]	-0.105** (0.019) [-0.022]	-0.091** (0.029) [-0.006]
Age Square	0.002** (0.000) [0.000]	0.002** (0.000) [0.000]	0.002** (0.000) [0.000]	0.002** (0.000) [0.000]
Married	-0.047 (0.029) [-0.012]	-0.022 (0.030) [-0.005]	-0.001 (0.031) [-0.000]	-0.089 (0.052) [-0.005]
Dependents	0.055** (0.014) [0.014]	0.051** (0.015) [0.012]	0.053** (0.015) [0.011]	0.017 (0.026) [0.001]
YP	-0.148 (0.154) [-0.036]	-0.057 (0.154) [-0.014]	-0.072 (0.163) [-0.015]	0.028 (0.251) [0.002]
JROTC	0.022 (0.027) [0.006]	-0.016 (0.028) [-0.004]	0.003 (0.029) [0.001]	-0.072 (0.050) [-0.004]
Low AFQT	0.136** (0.011) [0.037]	0.139** (0.011) [0.034]	0.144** (0.012) [0.031]	0.043* (0.009) [0.003]
No high School Diploma	0.417** (0.013) [0.123]	0.428** (0.013) [0.117]	0.411** (0.013) [0.100]	0.224** (0.021) [0.016]
More than High School Education	-0.005 (0.024) [-0.001]	0.017 (0.025) [0.004]	0.022 (0.026) [0.005]	-0.013 (0.042) [-0.001]
Medical Waiver	-0.101** (0.026) [-0.025]	-0.094** (0.027) [-0.022]	-0.107** (0.028) [-0.021]	-0.002 (0.044) [-0.000]
Other Waiver	0.098 (0.059) [0.027]	0.122 (0.061) [0.031]	0.143* (0.063) [0.033]	-0.039 (0.116) [-0.002]
Drug Waiver	0.537** (0.031) [0.172]	0.562** (0.032) [0.171]	0.331** (0.034) [0.083]	0.695** (0.040) [0.079]

Minor Traffic Waiver	0.062 (0.206) [0.017]	0.059 (0.211) [0.015]	0.037 (0.221) [0.008]	0.108 (0.328) [0.007]
Serious Traffic Waiver	0.331** (0.101) [0.100]	0.368** (0.102) [0.105]	0.291** (0.109) [0.072]	0.351* (0.148) [0.030]
Minor Non-Traffic Waiver	0.246** (0.077) [0.072]	0.270** (0.078) [0.074]	0.255** (0.081) [0.062]	0.146 (0.126) [0.010]
Serious Non-Traffic Waiver	0.215** (0.026) [0.062]	0.239** (0.027) [0.064]	0.156** (0.029) [0.036]	0.319** (0.039) [0.026]
Felony Waiver	0.243** (0.040) [0.071]	0.271** (0.040) [0.074]	0.136** (0.043) [0.031]	0.438** (0.055) [0.040]
FY2001	-0.146** (0.012) [-0.038]	-0.132** (0.013) [-0.031]	-0.139** (0.013) [-0.029]	-0.030 (0.022) [-0.002]
FY2002	-0.226** (0.013) [-0.058]	-0.191** (0.013) [-0.045]	-0.222** (0.014) [-0.045]	0.016 (0.022) [0.001]
Constant	0.504** (0.193)	0.602** (0.200)	0.341 (0.211)	-0.818* (0.333)
Observations	81326	81326	81326	81326
Observed P(attrite)	0.1922	0.1711	0.1399	0.0311
Predicted P(attrite)	0.1823	0.1590	0.1300	0.0267
Absolute value of z statistics in parentheses * significant at 5%; ** significant at 1%				

APPENDIX K. ALTERNATIVE UNSUITABILITY ATTRITION MODEL REGRESSION RESULTS

	Unsuitability Attrition	Behavior Related Attrition (Broad)	Behavior Related Attrition (Narrow)	Substance Abuse Attrition
Female	-0.390** (0.014) [-0.092]	-0.505** (0.015) [-0.104]	-0.444** (0.016) [-0.081]	-0.467** (0.030) [-0.022]
Black	0.237** (0.014) [0.067]	0.249** (0.014) [0.065]	0.199** (0.015) [0.045]	0.256** (0.023) [0.018]
Hispanic	-0.011 (0.016) [-0.003]	-0.004 (0.017) [-0.001]	-0.023 (0.018) [-0.005]	0.061* (0.028) [0.004]
Other Race	0.017 (0.028) [0.004]	0.031 (0.029) [0.008]	0.035 (0.030) [0.008]	-0.001 (0.040) [-0.000]
Age	-0.103** (0.017) [-0.027]	-0.118** (0.017) [-0.029]	-0.104** (0.019) [-0.022]	-0.093** (0.029) [-0.006]
Age Square	0.002** (0.000) [0.000]	0.002** (0.000) [0.000]	0.002** (0.000) [0.000]	0.002** (0.000) [0.000]
Married	-0.045 (0.029) [-0.012]	-0.020 (0.030) [-0.005]	-0.001 (0.030) [-0.000]	-0.081 (0.052) [-0.005]
Dependents	0.053** (0.014) [0.014]	0.049** (0.015) [0.012]	0.052** (0.015) [0.011]	0.013 (0.026) [0.001]
YP	-0.147 (0.154) [-0.036]	-0.058 (0.154) [-0.014]	-0.075 (0.164) [-0.015]	0.036 (0.025) [0.002]
JROTC	0.022 (0.027) [0.006]	-0.017 (0.028) [-0.004]	0.002 (0.029) [0.000]	-0.069 (0.049) [-0.004]
Medical Waiver	-0.102** (0.026) [-0.026]	-0.095** (0.027) [-0.022]	-0.107** (0.028) [-0.021]	-0.005 (0.044) [-0.000]
Other Waiver	0.101 (0.059) [0.028]	0.124* (0.061) [0.032]	0.144* (0.063) [0.033]	-0.032 (0.115) [-0.002]
No conduct waiver, high school or above, low AFOT(<50)	0.161** (0.013) [0.044]	0.168** (0.013) [0.042]	0.174** (0.014) [0.038]	0.059* (0.023) [0.004]
No conduct waiver, no high school, high AFOT(>=50)	0.478** (0.016) [0.146]	0.492** (0.016) [0.141]	0.464** (0.017) [0.118]	0.296** (0.027) [0.023]
No conduct waiver, no high school, low AFOT(<50)	0.509** (0.022) [0.160]	0.521** (0.023) [0.154]	0.510** (0.024) [0.136]	0.244** (0.039) [0.019]
Conduct waiver, high school or above, high AFOT(>=50)	0.371** (0.026) [0.113]	0.408** (0.026) [0.117]	0.255** (0.029) [0.061]	0.546** (0.037) [0.054]

Conduct waiver, high school or above, low AFOT(<50)	0.560** (0.035) [0.181]	0.582** (0.036) [0.178]	0.417** (0.038) [0.108]	0.630** (0.049) [0.068]
Conduct waiver, no high school, high AFOT(>=50)	0.672** (0.038) [0.223]	0.707** (0.038) [0.225]	0.607** (0.040) [0.170]	0.561** (0.056) [0.058]
Conduct waiver, no high school, low AFOT(<50)	0.699** (0.072) [0.235]	0.726** (0.073) [0.233]	0.574** (0.077) [0.160]	0.671** (0.099) [0.076]
FY2001	-0.140** (0.012) [-0.036]	-0.126** (0.013) [-0.030]	-0.134** (0.013) [-0.028]	-0.022 (0.022) [-0.001]
FY2002	-0.225** (0.013) [-0.057]	-0.190** (0.013) [-0.045]	-0.221** (0.014) [-0.045]	0.019 (0.022) [0.001]
Constant	0.495* (0.193)	0.585** (0.199)	0.318 (0.211)	-0.806* (0.333)
Observations	81326	81326	81326	81326
Observed P(attrite)	0.1921	0.171	0.1399	0.0310
Predicted P(attrite)	0.1822	0.1588	0.1299	0.0266
Absolute value of z statistics in parentheses * significant at 5%; ** significant at 1%				

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